The Builder.

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PEOPLE say architecture is a noble art, and so it truly is: its influence on taste and morals is undeniable, for, as an American writer observes,—"There is a kind of symmetry in the thoughts, feelings, and efforts of the human mind. Its taste, intelligence, affections, and conduct, are so intimately related, that no preconcertion can prevent them from being mutually causes and effects. The first thing powerfully operated on, and, in its turn, proportionally operative, is the taste. The perception of beauty and deformity, of refinement and grossness, of decency and vulgarity, of propriety and indecorum, is the first thing which influences man to attempt an escape from a grovelling, brutish character; a character in which morality is effectually chilled, or absolutely frozen,"—and so on, and so on. Those who profess this noble art should be gentlemen—*must* be gentlemen: men of education and cultivated taste, with more acute perceptions and finer feelings than the multitude. The sense of beauty is necessarily accompanied by a feeling of its superiority over deformity, and may be supposed to confer this superiority on those who possess it over those who do not. To stand under the shadow of a *once* great name,—every one remembers what Vitruvius looks for in the architectural character,—integrity, high feeling, nobleness of heart. For an architect even to solicit employment was an abasement, in the eyes of the accomplished Roman, of both art and artist, not to be endured. And we emphatically say the Roman was right.

So far then our exordium: and now we will just let our readers see what is thought of this noble art, and its high-minded professors, in at all events one district of Great Britain,—the good town of Ipswich.

The committee of the Mechanics' Institution there, proposing to erect a building for the purposes of the society, and desiring to have the best plan, and a choice of plans in order that they may get the best plan, have issued an advertisement to "Architects and *Builders*," stating this desire. They set forth that the building must not have more than 60 feet of frontage, and must comprise,—"A lecture room, about 30 feet high, to accommodate a lecturer and a company from 600 to 800 persons; a library and reading-room, or the two combined; a committee-room, class-room, and a good vestibule entrance; also rooms for the residence of the librarian;" and they say that the whole must not exceed the cost of 1,600*l.*

The plans are to be sent in under a private mark; and, will you believe it? no less a sum than FIVE GUINEAS will actually "be given for the one most approved, if the party be not employed to carry it out." Listen to this, ye Inigos and Christophers of England! Talk no more of want of encouragement, ill-appreciation, insults to art,—but sit ye down to your tables; use the knowledge ye have acquired at so much cost and labour; and respond to this benevolent offer in the way it deserves.

And if you do so, it will be with one universal burst of contemptuous indignation, sufficient to awaken these gentlemen of Ipswich from the ignorance which led to such a proposal, deter other committees from offering a similar insult, and perhaps effect an alteration in the miserable and degrading system altogether.

There is no mistake in the advertisement: it runs clearly, FIVE GUINEAS will be given *for* the one most approved, if the party be not employed to carry it out; goes on to say the institution is open to offers for sites or *premises* that are eligible (in the event of which latter not being found, the plans, of course, will not be carried out by any one), and is signed J. Allen Ransome and Henry Lawrence.

We wonder if Mr. J. Allen Ransome and Mr. Henry Lawrence felt ashamed of the document when they signed it? ashamed of themselves and their colleagues? If they did not, it must have been for want of thought on what they were doing.

If an architect were commissioned by an employer to design and prepare the plans for such a building, five-and-twenty pounds would be a moderate charge for them. And yet in the present case, architects are unblushingly invited to prepare these plans for merely the *chance*, the very remote *chance*, of getting five pounds, five shillings, or one-fifth of what they would be fairly entitled to charge. Apply the invitations, as we have often said, to lawyers, and doctors, butchers, and bakers; and while its absurdity is made manifest, the low and degraded position to which the profession of architecture is reduced also becomes strikingly apparent. Would Messrs. J. Allen Ransome and Henry Lawrence venture to put their names to an advertisement, offering five pounds for the best five-and-twenty pounds' worth of, say mechanism, of no use to any but the advertiser? or if they did, would a mechanic be found, however vain he might be of his skill, and anxious to shew it, who would spend his time on such a losing game, even if certain that the *best* would have the miserable prize (?) which, in the case of the architects, is very far from clear. Or as we inquired when the fishmongers and poulterers advertised for the best plan of an asylum—what would fishmongers and poulterers say if they were asked to obtain and submit some particular kind of game (never called for by their every-day customers) on the *chance* that it would be bought at the ordinary market price? "But then, say the poulterers, *fowls* cost money, and are really worth something, whereas the *designs* you speak of are merely drawings, which, unless we take them, will not realise the cost of the paper they are made upon; so that the cases are not parallel.

Truly the cases are not parallel. An honest, able design represents not merely present time and thought, but a large premium and outlay in other respects, long travel, years of study, and many previous, and unsuccessful attempts. But whatever can be had for nothing is literally worth nothing: and thus it is that architects have lowered the character of their profession, and degraded themselves.*"

The poulterers were bad enough, and we told them so; but the *savans* and wisdom-lovers of Ipswich are a hundred times worse. The former did pledge themselves that the author of the selected design should carry it out, if found to have experience; but the Ipswich philosophers, while they offer to the *successful* candidate half the absurdly small sum which the others gave to the first unsuccessful competitor, do not even hint at employing him, but, indeed, make it as apparent as it can be made without saying so in words, that they do not contemplate any such step.

The question now comes, will architects be found to countenance a system, of which this is so bare-faced and insulting an illustration, by submitting plans on the terms proposed?

Earnestly we hope not, as well for the sake of the art as of the profession; and we trust that some steps will be taken, to let the enlightened committee of the Ipswich Literary Institution know the feeling with which their advertisement is viewed by the profession at large.

* Vol. IV., p. 189.

CHEMISTRY AS APPLIED TO CONSTRUCTION.

BY PROFESSOR GRIFFITHS.

INTRODUCTORY.*

PROBABLY fifty-five substances must be regarded as *elements* in the present state of chemical science; their names are here subjoined in alphabetical order. Those marked * are combustible and non-metallic; those marked † are incombustible and non-metallic, the others are metallic.

1, aluminum; 2, antimony; 3, arsenicum; 4, barium; 5, bismuth; 6, * boron; 7, † bromine; 8, cadmium; 9, calcium; 10, * carbon; 11, cerium; 12, † chlorine; 13, chromium; 14, cobalt; 15, columbium; 16, copper; 17, † fluorine; 18, glucinum; 19, gold; 20, * hydrogen; 21, † iodine; 22, iridium; 23, iron; 24, lantanum; 25, lead; 26, lithium; 27, magnesium; 28, manganesium; 29, mercury; 30, molybdenum; 31, nickel; 32, † nitrogen; 33, osmium; 34, † oxygen; 35, palladium; 36, * phosphorus; 37, platinum; 38, potassium; 39, rhodium; 40, * selenium; 41, silicium; 42, silver; 43, sodium; 44, strontium; 45, * sulphur; 46, tellurium; 47, thorium; 48, tin; 49, titanium; 50, tungstenum; 51, vanadium; 52, uranium; 53, yttrium; 54, zinc; 55, zirconium.

Of the elements, the following will be most frequently mentioned during these papers on chemistry as applied to construction:—

I. Combustible and non-metallic: carbon, hydrogen, phosphorus, and sulphur.

II. Incombustible, and non-metallic: chlorine, nitrogen, and oxygen.

III. Metallic: aluminum, calcium, iron, magnesium, potassium, silicium, and sodium.

The leading chemical characters of these fourteen elements are as follows:—

Carbon, a non-metallic combustible solid, perfectly unalterable by exposure to all vicissitudes of atmospheric temperature, or to the joint agency of air and water; but when its temperature is artificially raised, it burns by combining with oxygen, and produces carbonic acid gas. This compound unites with many metallic oxides to form *carbonates*, and they are of great utility and importance.

Hydrogen, a non-metallic gaseous element, eminently combustible, and producing during its combustion *water*, by uniting with the oxygen of the air. Hydrogen also combines with several non-metallic, and a few metallic elements, and it, in common with carbon, is most generally existent in organic bodies.

Phosphorus, a non-metallic element, solid, but combustible at a very slight elevation of temperature, and producing, by uniting with the oxygen of the air, *phosphoric* acid; this combines with many metallic oxides, and forms *phosphates*: some of these are important.

Sulphur, a non-metallic element, solid and easily combustible, and producing, during its combustion in air, *sulphurous acid*, or by modifying its combustion, in contact with certain compounds containing oxygen, the product is *sulphuric acid* or *oil of vitriol*; this acid combines with the generality of metallic oxides, forming *sulphates*, a very definite and extremely valuable class of compounds.

Chlorine, a non-metallic incombustible vapour of a greenish yellow colour, eminently poisonous, but a powerful disinfectant, and destroyer of colouring matters; it combines with the generality of the metallic and non-metallic elements, producing definite compounds, called *Chlorides*, when they are not acid. The great natural source of chlorine is common salt, a binary compound of chlorine and sodium.

Nitrogen, a non-metallic incombustible gas, a perfect type of a non-supporter of combustion, existing in a state of uniform mixture with oxygen, carbonic acid, and watery vapour

* See p. 47, *ante*.

to constitute atmospheric air; but when combined with oxygen, forming several compounds, amongst which is *nitric acid* or *aqua fortis;* this combines with most metallic oxides, and forms an important class of compounds called *nitrates*.

Oxygen, a non-metallic incombustible gas, but a powerful inducer and supporter of combustion; it is universally present throughout nature, in air, in water, in earth, and most organic bodies. Its compounds with other elements, when not acid, are termed *oxides*, thus, all the substances formerly called earths or calces, are true oxides of metals.

Aluminum, calcium, magnesium, and *silicium* are metals obtained from clay, or alumina, lime, and magnesia, and *silica;* they are extremely difficult to procure, on account of their extraordinary affinity for oxygen; hence, in a pure state, they are not practically known, but their compounds are of vast utility and interest.

Iron, a metal most abundantly presented throughout nature in a state of combination, and especially with oxygen. It forms two *oxides*, and these are capable of combining with various acids to form compounds, which constitute the basis of many colours and stains: it is a metal having a very extensive and practically valuable range of chemical affinity.

Potassium and *sodium* are the metals of the alkalies potash and soda. These metals are difficult to obtain on account of their energetic affinity for oxygen, and they are only of importance in the refined operations of analytical chemistry; but their compounds with oxygen, and of these with other oxides and acids, are of great value in most departments of science, art, and industry.

Many of the metallic elements are employed in a pure or insulated state, as, for example, iron, copper, tin, lead, or zinc; in the form of beams, bars, rods, sheets, tubes, and pipes of all sizes, shapes, diameters, and thicknesses.

The compounds which some of the metals form with each other are technically called *alloys;* these are in universal request in decorative architecture; for example, bronze, and brass; the former a compound of copper and tin; the latter, of copper and zinc. The hard and soft solders, also, used for uniting the several parts of metallic work, are all alloys of various metals. These alloys, generally speaking, are more fusible than the individual metals of which they are composed, and, therefore, admit of being applied with great facility.

The precious metals, gold and silver, are employed in decorative architecture even to a lavish extent. But the great value of these elements would entirely preclude their use if they did not possess the important physical property of malleability, or extension into leaves of extreme tenuity, in a degree superior to all other metals; for as regards gold it may be stated, that a cubic foot of the precious metal admits of being beaten into leaves sufficient to cover nearly one hundred thousand square yards. Then the permanence of gold, and good gilding, is remarkable. It has no affinity for oxygen, or any other substances that are existent in air or in water; it, therefore, preserves its deep orange lustre unimpaired for centuries,—witness, for example, the golden ornaments and the gilding that embellish the cases of Egyptian mummies. Silver, on the other hand, although of a beautifully chaste white lustre, will soon become tarnished or dull. This change is not due to oxidation, but to the action of sulphureous vapours upon the metal, by which a thin scale of sulphuret of silver is formed, and this acts as a shield to the metal beneath. The silver and silvering found in many ancient cathedrals, churches, and abbeys, is frequently thus tarnished, or blackened, and to a very great extent, if in the immediate vicinity of decomposing organic bodies.

The use of silver is almost excluded from theatrical decorations and properties, unless it be strongly lacquered, to keep off the action of the sulphureous compounds which are emitted during the combustion of coal-gas, and very few silversmiths or jewellers can venture to illuminate their shops with coal-gas unless great care has been taken in its purification. It is no easy task to free gas entirely from compounds of sulphur, hence the recent plan of having the gas lamps outside, instead of inside the windows, to exclude the action of sulphur, and also the heat, and watery vapour, resulting from the combustion, all of which conduce to the tarnish.

The chemical habitudes of the metals require much study from the architect, for a metal alone may be extremely permanent, but will often corrode rapidly if in contact with another metal; thus, for example, copper or zinc, alone, will resist oxidation for a great length of time, but let them be rivetted together, and exposed to the vicissitudes of the atmosphere, and the zinc will soon sustain corrosion. The chemist discovers that the mere contact of dissimilar metals disturbs their electrical relations, thus zinc renders copper electro-negative, and in that state it will not suffer chemical change, whilst the zinc becomes electro-positive, and in that state, although capable of protecting the copper, suffers oxidation and corrosion itself.

This fact having been pointed out by the chemist to the architect and builder, we now find when plates or masses of metals are to be employed, care is taken to examine strictly their electro-chemical relations or habitudes, that corrosion may be prevented, though in many cases the fact cannot be conveniently rendered applicable. Look, for example, at railings of cast, but more especially of wrought-iron, when firmly secured into stonework by pouring molten lead around them, how often they decay and dwindle away in some cases to mere wires, especially at their lower parts, immediately in contact with the lead, the iron being rendered electro-positive, and therefore capable of undergoing oxidation by the joint agency of air, water, and the animal fluids that are so commonly voided against corner rails. Although the common metals, *ex. gr.*, tin, copper, lead, iron, &c., are so extremely plentiful and cheap, they are not presented by nature either in purity or quantity adequate to the supply of the enormous demand that is made for them in the arts of life, and as they are all elements, of course the chemist cannot form them artificially. The metals are presented by nature in combination with non-metallic elements, generally oxygen and sulphur, constituting *oxides* and *sulphurets*, or as oxides combined with acids, constituting *carbonates* and *sulphates*; such compounds are known to the chemist under the title of *metallic ores*. Thus the tin ore of Cornwall is an *oxide*, whilst the copper ore of that county is a *sulphuret*, and the iron ore of Staffordshire is a *carbonate*, these are familiarly known as *tin-stone*, *copper pyrites*, and *iron-stone;* they contain the metals, tin, copper, and iron; the art of obtaining such valuable forms of matter is founded upon known laws of chemical affinity, and consists in exposing the respective ores to heat, with some non-metallic element, having a strong affinity for that in the ore, but none for the metal; this operation is called *reduction*, and during its procedure the metal is *not made* or *produced* by the agents employed, but *drawn forth* or *educed* from its natural combination with a non-metallic element.

The following example may serve to explain the theory of the process of reduction. If a piece of charcoal be heated red hot, it will rapidly consume; this is a chemical change and due to the charcoal or its pure *carbon*, exerting affinity for the *oxygen* of the surrounding air, so that the product of the combustion is *carbonic acid gas;* the chemist ascertains by analysis, that the ore of tin consists of the metal and oxygen, and having as in the above simple instance discovered that charcoal at a high temperature has an affinity for oxygen; he mingles charcoal with the ore of tin, and expects upon heating the mixture in a furnace, that the charcoal will burn by attracting the oxygen of the ore, that carbonic acid will be *produced*, and then the metal thus deprived of oxygen or *deoxidated* will be *educed;* the correctness of this reasoning is borne out by experiment, and conducted upon a large scale it furnishes all the commercial demands for the metal tin.

The natural and artificial compounds of oxygen with the metals present a vast mass of useful materials for the purposes of the architect and the builder. All of these have been laboriously and accurately examined by the chemist.

Thus pure white clay, sand, and lime, although commonly called *earths*, are true *metallic oxides*, the constituent metals being so firmly united to oxygen by the power of chemical affinity, that they do not admit of extraction or reduction by ordinary decomposing agents, but by employing such, in conjunction with the action of electricity, three extraordinary metals, viz., *aluminum*, *silicium*, and *calcium*, reward the researches of the experimentalist.

In consequence of clay, sand, and lime, undergoing no reduction to the metallic state by the sole agency of heat, they become eminently fitted for the construction of fire-places and furnaces, not only for the combustion of fuel for warming dwellings, but for that required in the reduction of ordinary metallic ores and the formation of every variety of earthenware, porcelain, glass, and vitrifications, as will be more particularly shewn hereafter. Native compounds, or in some instances, native mixtures, and in others artificial mixtures of these substances with other metallic oxides, constitute all the varieties of granite, slate, terras, puzzolano, and cement. Oxide of iron is most abundantly distributed throughout nature, and more particularly in all common kinds of clay, it has a very intense affinity for the pure white alumina of clay, and the red colour of bricks, tiles, and articles of common pottery is referrible to its presence in a high state of oxidation induced by the heat and air of the clamp or kiln in which such useful materials are burned or baked. Then the chemist by attentively studying the characters of ordinary metallic oxides, finds that they have the power of uniting with those used in the manufacture of earthenware, and of conferring various splendid and highly permanent colours, thus the oxides of chrome, cobalt, and manganese, respectively confer all shades of green, blue, and purple.

The glass employed in window-sashes is a compound of metallic oxides, crown-glass, for instance, consisting of oxide of silicium or *silica*, and oxide of sodium, or *soda;* whilst the softer and more brilliant glass called flint-glass consists of silica oxide, of potassium, or *potash*, with the addition of litharge, or *oxide of lead;* to this its extreme brilliancy and high refractive power are referrible, and hence its admirable adaptation to the splendid cut-glass chandeliers, lustres, &c., which are introduced by the hand of decorative art. All the beautiful varieties of stained glass are compounds of metallic oxides; and seldom, indeed, do we imagine, when gazing upon, and admiring the effect of the beams of rainbow-coloured light that pierce through the party-coloured panes of a magnificent cathedral window, that the glass, under the hands of the chemist, may be caused to reveal more beauties that those immediately apparent to the eye; but such is the case, for the deep ruby red is conferred by gold, the bright yellow by silver or antimony, deep orange by iron, green by iron or copper, blue by cobalt, purple by manganese, and the various shades of colour by the judicious admixture of those metallic preparations with each other in originally colourless glass, the same as various shades may be produced by adding ordinary pigments to white lead upon the palette of the artist,—with this exception only, that vitrified colours will never fade or deteriorate; witness the vitreous relics of Egyptian art.

Pursuing our inquiries regarding "Chemistry as applied to construction," it appears that all kinds of mortar essentially consist of oxide of calcium and oxide of silicium, or, in other words, lime and sand; whilst hydraulic cements, which harden or set under water, contain, in addition, oxide of aluminum, or alumina, and oxide of iron. These latter substances confer the peculiarity belonging to such cements, in consequence of a very powerful and beautiful affinity that is brought into action when they are mingled with the materials of common mortar. This important subject will open a wide field of discussion. Oxide of calcium, or lime, naturally combined with carbonic acid, and in many cases involving other metallic oxides, presents the architect and the builder with every variety of pure white and veined marble, free-stone, Bath-stone, lime-stone, calcareous spar, chalk, and whiting.

In the language of chemistry, the combination of an oxide with an acid is called a *metallic salt*, however it may differ in its character from common salt, which is a binary compound of chloride of sodium.

Alabaster, gypsum, plaster-stone, and plaster of Paris, consist of sulphuric acid and lime, and are more or less pure according as they

are perfectly white, for the red coloured, or veined, specimens contain oxide of iron. In examining these sulphates of lime, the chemist points out how the characters of substances may be disguised by the power of affinity; for sulphuric acid and lime, in a pure or insulated state, are excessively caustic and poisonous, and cannot be exposed to the air without undergoing change; but upon being united they form a compound perfectly neutral, having no poisonous property, and which will endure for ages unchanged, as the sculptured work of many ancient funeral monuments so amply testifies.

Most of the materials employed as paints or colours are salts of metallic oxides. The yellow colour given to old brickwork previous to the operation of pointing, is due to the oxide contained in sulphate of iron or green vitriol, being extracted or precipitated by the greater affinity of lime for the sulphuric acid. White lead is a carbonate of the oxide of lead; blue and green verditter are carbonates of oxide of copper; chrome yellow a compound of chromic acid and oxide of lead, whilst vermilion is a direct compound of sulphur and mercury, or a sulphuret of mercury, and common bronze-powder, a sulphuret of tin.

These examples may suffice to prove how largely the architect, the builder, and the decorative artist draw upon the elementary metals and metallic compounds for materials suited to the pursuit of their respective professions, and that chemistry as applied to construction presents many important and useful facts to their notice. But we can proceed further; let us turn our attention to some of the non-metallic elements and their compounds or mixtures. The basis of all black paints is *carbon*, in various states of mechanical division, known as lamp-black, ivory-black, and vegetable black. The very pencil point with which the design of the palace or the cottage may be traced, although familiarly called "black lead," does not contain a particle of lead; it is a variety of carbon, in a pure and soft state; and the diamond, employed by the artificer to cut the tables of glass, is the same element carbon, absolutely pure, crystalline, and the hardest substance known to the experimentalist.

This same Protean element carbon, as elicited by the decomposition of organic remains, confers the blackness upon the much admired marble called *Lucullite;* and if the chemist cause affinity to ensue between carbon and iron, the result is cast-iron and steel; without the latter compound fashioned into tools, the architect could not have his designs properly and effectually executed.

Another extraordinary element is *hydrogen*. Although never presented pure by nature, it exists in combination with oxygen to constitute water, a liquid of the most universal employment for tempering clay, mixing cement, stains, colours, and for aiding the sawing, grinding, and polishing of marble, stone, glass, metals, and so forth.

But water, thus useful and indispensable, is a natural agent against whose effects it is the constant aim of the architect and builder to be prepared, for it contributes in no small degree both mechanically and chemically to the disintegration and decay of many materials employed in construction.

These may appear perfectly compact, yet close examination proves them to abound in minute pores, which, in virtue of an attraction purely mechanical, called capillary attraction (like that of a sponge), eagerly absorb, and tenaciously retain, water derived from the clouds or from the humid soil of foundations, and thus remain damp; some idea of the extent to which this absorption and retention takes place may be formed from the fact, that a single good and apparently sound stock brick, such as is employed in the generality of metropolitan buildings will absorb and retain upon the average eleven ounces of water.

Accordingly, if mortar or cement be laid on dry bricks, the water is rapidly absorbed, and little or no cementation takes place; hence the utility of soaking the bricks in water, or lime water, to fill the pores, so that the water of the mortar may be not rapidly, but gradually absorbed, as the brickwork dries, supposing always the situation is suitable for the drying to ensue.

If porous brick or stone-work saturated with water be exposed to frost, the water passes from the liquid to the solid state, or in more familiar terms freezes, and in so doing it expands with vast force, a force that the particles of the materials are unable to withstand; accordingly, they are riven asunder, chiefly at the surface, and in the course of time by the alternations of thaw, frost, and heat, a considerable amount of disintegration and decay is the consequence; many public buildings present striking examples of this fact.

Water forms an essential, and, in many cases, a truly definite, constituent of building materials. Thus *slaked* lime, although it may feel perfectly dry, in every 100 parts, contains 25 parts of water, and such lime the chemist terms *hydrate of lime*. The above quantity of water is theoretically required to slake 75 parts of quicklime, although in practice, a larger quantity is generally added; alabaster and gypsum owe their beauty, translucency, and compactness, to the presence of water, chemically combined in the proportion of about 20 per cent., and are *hydrated* or *enhydrous* sulphate of lime, if the water be expelled by the action of heat, they become opaque white, and *anhydrous*.

Thus plaster of Paris is *anhydrous*, and when artificially mixed with water, the well-known property of setting and hardening is due to affinity between the sulphate and the water, by which the latter is solidified.

Water, although so abundant throughout nature, is never chemically pure, or solely consistent of its two elements, hydrogen and oxygen; it contains various saline matters derived from the strata of the earth, and these impurities, however minute in quantity, perfectly interfere with its use in refined experiments; and where they exist in abundance, as in some kinds of river water, or more especially in sea water, they interfere with its employment by the architect and builder. The purity of water employed in mixing clay, mortar, cement, and colours, although a matter of great importance, is but too often neglected by practical men, and the consequence is, that blotches and efflorescences disfigure the work, originally destined to be fair and beautiful.

To those who have not made the science of chemistry a branch of study, the foregoing statements as to the earths and earthy materials (popularly so called), being metallic oxides, may appear extraordinary. If this be the case, how much more extraordinary will appear the ensuing statement,—that all kinds of timber consist of the elements *oxygen*, *hydrogen*, and *carbon!* but such is the chemical fact; and not only consist of these non-metallic and diametrically different elements, but in definite weights, so exactly apportioned, that their individual characters are as perfectly neutralized as in the case of sulphuric acid and lime, when united to form alabaster.

In perfectly good, dry timber, free from any great excess of turpentine, resinous matter, or knots—say, for example, well-dried American pine—the elements, oxygen and hydrogen, are found in the exact proportions requisite to the constitution of *water*, and these combined with an equal weight of the element *carbon*. The accumulation, the, elaboration of these three elements by the vital, or organic powers or functions of the vegetable kingdom is most wonderful, and upon it the chemist reflects and experiments with the full intensity of delight and admiration;—it throws all his limited artificial operations into the shade of insignificance.

Look, for example, at the dry timber of an oak tree, weighing say thirty tons; look at its hardness, its compactness, its strength, its durability, and then reflect for a moment upon the statement that the chemist can make regarding its composition! it will "move our especial wonder."

Who would imagine that the timber of the tree contained, in a solid state, the identical elements of the flowing river upon whose banks it grew and flourished, combined with the elementary matter of the sparkling diamond?

But such is the chemical truth; for in the thirty tons of dry oak timber there are consolidated fifteen tons of *water* and fifteen tons of *carbon*.

Then again, the pure matter of wood, thus constituted, or woody fibre or *lignin*, as it is called, wonderfully elaborated by the hand of nature, chemically the same as that of solid oak, mechanically different in point of aggregation, presents every variety of hemp, flax, and cotton. These valuable organic forms, by artificial processes, are manufactured into canvass, linen, calico, and paper, and all used in construction, either in a plain state as they are sent forth from the loom or paper-machine, or most elaborately or richly adorned with chemical elements or compounds under the hands of the decorative artist, to constitute the magnificent paintings in oil or water colours, or the stained hangings which embellish the walls of a finished edifice.

The very same elements, oxygen, hydrogen, and carbon, in other proportions, and especially with more hydrogen than is essential to the formation of water, constitute the black and solid coal, the white and solid wax, the yellow and liquid oil, which are employed for warming and illuminating our dwellings; and coal, when artificially deprived of oxygen, leaving only hydrogen and carbon in combination, forms the transparent, invisible, inflammable gas, which is rapidly superseding all other materials for artificial illumination. Resins, gums, bitumens, the alcohol, the oils in which they are dissolved to constitute varnish, lacquer, and polish, consist of the three elements, oxygen, hydrogen, and carbon.

But the materials for an edifice would be incomplete without the stores of chemical compounds that abound in the animal kingdom; and in seeking out the ultimate elements of this wonderful and elaborate realm of nature, the chemist arrives at the extraordinary—the inexplicable conclusion, that animal products contain the same elements as those of vegetables, with the addition, in the generality of cases, of the element *nitrogen*.

Glue, size, serum, and albumen of blood, parchment, all used for cements or distemper painting, contain the above four elements, and so likewise the hair, feathers, and down of the luxurious chair or sofa, its silken covering, the silken hangings, the soft deeply piled carpet.

And lastly, when the mineral, vegetable, and animal kingdoms have been each in turn explored and ransacked by the architect and builder for the materials of an edifice, the agency of an imponderable element, by which they are all more or less affected, has to be well and correctly examined,—viz., the universal and all-important agency of *heat*,—or vain will be the attempt to render the edifice a comfortable habitation.

The most general effect of heat upon the three physical states or forms of matter, is to cause their expansion or enlargement of bulk; and amongst solid substances the metals and their alloys are most susceptible of this change. Thus, if a bar of metal be accurately measured in length and diameter at the temperature of 32°, and then exposed to the heat of the sun at 70°, it will be found to have sensibly increased in bulk.

The chemist discovers that all metals will expand by heat, but some do so much more than others; thus lead is the most expansile of the common metals, and platinum the least. This expansion takes place with enormous force, which no mechanical power can restrain.

Native and artificial compounds, such as granite, limestone, marble, wood, brick, plaster, stucco, and so on, also expand by heat, but in a degree vastly inferior to the metals and their alloys; but in all cases the expansion is temporary, and the various substances return to their original dimensions when the heat is withdrawn, or, in other words, when they are cooled to the degree that they had at the outset of their measurement.

In reference to the materials employed in construction, knowledge regarding their expansion by heat and contraction by cold is of the utmost importance to the architect, for their dimensions are constantly undergoing changes by the ordinary fluctuations of atmospheric temperature. Iron, or other tenacious metal, is frequently introduced into stone or brickwork, for the purpose of conferring stability upon a structure; but, if injudiciously employed, becomes the most active agent in promoting its instability. Thus, during a warm day, the metal becomes heated, it expands in all directions,—so does the stone or brickwork, but not to an equal extent; and, therefore, it is thrust out of position, and remains where thrust, so long as the heat of the day continues; but as the cool of night approaches, the metal cools and contracts rapidly to its original dimensions, whilst the contrac-

tion of the stone or brickwork is extremely slow, and never can follow up that of the metal, and, accordingly, is compelled to remain, very nearly where it was thrust or forced by the metal. This operation of expansion and contraction being constantly proceeding, the masonry or brickwork soon become unsteady by detachment from the mortar or cement. Again, if an iron plate be inserted in a wall for giving it support, and then to disguise this it be plastered over, the consequence is, that in a very short time the plaster will be cracked by the expansion of the metal beneath.

The coping stones of walls are frequently but most injudiciously held together by cramps of iron "firmly imbedded in lead," and such pieces of metal, if of cast-iron, which is brittle, often break during the first frost, from a tendency to contract by the cold more than the stonework will permit; or if they be made of wrought-iron, which is tough, then, instead of rupturing, they generally rupture the stonework, and so loosen themselves from their leaded sockets. Then in the construction and setting of iron stoves or fire grates, the expansion and contraction of metal requires to be well investigated, and to be well guarded against, or in a short time the whole arrangement will become ricketty; unsightly gaps and chinks will appear around the metal work, and not unfrequently the marble chimney-piece will be distorted from its true position, or even broken.

These are all instances in which chemistry may be advantageously applied to construction, and the principles of the science likewise demonstrate to the architect and builder that in their attempts to heat edifices by hot air, hot water, or steam, the pipes for the conveyance of such agents should never be rigidly fixed or firmly abutted against the walls or other solid obstacles, lest the pipes in expanding may cause distortion or eventually overthrow, and the same fact is applicable to the employment of iron beams, &c.

The chemical nature of atmospheric air, and its expansions and contractions by heat and cold, most imperatively demand attention from the architect and builder, for this wondrous medium is the very pabulum of all warming and ventilation. Atmospheric air is a *mixture* of the gaseous elements oxygen and nitrogen. Its changes of volume and of levity by alternations of natural or artificial temperature are great and sudden; and, to maintain air of a genial warmth without disturbing the relative proportions or characters of its elements, which would unfit it for the support of life; to give free egress to such portions as become chemically vitiated by respiration and combustion, whilst free ingress of pure air is at the same time abundantly allowed, are matters literally of vital importance, but of extremely difficult practical application.

Absolute ignorance, or wilful neglect of the chemical habitudes of the atmosphere, have opened a vast and fertile scope for quackery, not only as regards the futile attempts at warming and ventilating extensive and costly edifices, but in the construction of flues and chimneys of ordinary dwellings, so that the roofs are disfigured with abortive contrivances in the shape of creaking caps and clattering cowls, "to make the fires draw."

In these two introductory papers, on "Chemistry as applied to Construction," the writer has endeavoured to present a general outline of the nature of the science, the business of the chemist, the nature and properties of elements and compounds, and the extreme importance and utility of such knowledge to the architect and the builder. Having thus in some measure introduced the agents that are to be employed, the reader will be prepared for the particular discussion of the individual materials used in construction, for example, marble, stone, brick, mortar, cement, glass, and other vitrifications, paint and varnish, the metals, iron, copper, zinc, tin, and lead, and their alloys. These will afford a vast fund of useful information, and to them future papers will be devoted.

LEOMINSTER BUTTER-CROSS.—This ancient piece of architecture is now about being removed from its long resting place. A local paper says, "it will be placed on wheels, and moved to where some old houses now stand behind it."

DECORATIONS AT SIR ROBERT PEEL'S.

THE principal staircase of Sir Robert Peel's house, in Whitehall-gardens, has been decorated by Messrs. Collman and Davis in encaustic colours. This staircase is very simply arranged, the walls of the ground-floor being mainly taken up by a simple flight of steps to the principal floor, bearing four lofty panelled walls above; the whole of the ceiling is divided into numerous compartments, filled in with ground-glass, and forms one skylight. In the centre of the four principal panels are introduced, as chief subjects, the four seasons, represented in figures of considerable size, painted in relief on dark grounds. Beneath these are painted, in twelve smaller compartments, figures composed in reference to the principal subjects. Arabesque ornaments surround the centre paintings, and fill in between the others in fanciful devices, and also enrich the upper part and sides of the large panels, which are besides framed by a quietly coloured border connecting the whole. In the architectural members of the walls, cornice, and glazed ceiling, rich colour and gold is introduced to harmonize with the rest. The style of the decoration is of a classical character, in accordance with the architecture.

PROPOSED ARCHITECTURAL SOCIETY FOR STUDENTS AND DRAUGHTSMEN.

LAST week we printed the first part of a paper on the state of architectural education, read by Mr. Kerr, before the Association of Architectural Draughtsmen. This treated of present deficiencies, great and numerous enough! In the second portion of the paper, which we now give, a remedy is suggested.

The School of Design being provided for the preparation, there must now be had some powerful means of study to follow it up, build upon it, perfect, and apply it. And certainly for this period, and for this subject, a very valuable principle indeed is that upon which the system of mutual instruction and collective investigation is founded, which is so well known among us in the form of our many scientific societies. This principle I hold to be more valuably applicable in the early manhood than in any future period of life whatever; for in our every day public associations the main spring is always in the energy of an enthusiastic few,—apply the principle to youth, and this energy is that of an enthusiastic many—perhaps I might say an enthusiastic all. And even when the principle spreads into debate and controversy, still it is valuable,—perhaps even on this account the more valuable. We differ in opinion; we always have differed,—we always will. And this fact, which the thoughtless will set down as a curse of war lying upon fallen man, is in fact a beautiful scheme in Creation for effecting the grand purpose of Earth's advancement. Were we all of one mind, human nature would settle down and stagnate. But we are more wisely made, and by this very spirit of controversy,

> "Thro' the ages one increasing purpose runs,
> And the thoughts of men are widen'd by the process of the suns."

An Architectural Society for young men, if such could be properly established upon a broad basis, to be secure, its face in the right direction, and with a few good leaders to guide, would be, I confidently believe, a most powerful means of good architectural education. Laying hold of the architect's mind at the best period for the energy and thought required, and providing him with an excellent means of encouragement, the cordial study of the Art would be, I am persuaded, directly and most valuably produced. And particularly am I sanguine of its good effects in view of the peculiarities of our special subject. In the Institute of Architects the principle spoken of must be admitted, in so far as regards any incentive to study and research among its members, to have signally failed. A great cause of this is to be found in the undeniable fact that the younger members of the profession are, to all intents and purposes, completely excluded from any part in its transactions. The principle is applied too late in life: take the architect a few years earlier, when study and research are his element, and your expectation may be a very different result. The study which is demanded must be mainly over before the commencement of practice; complete establishment may be not improperly taken as equivalent to the complete extinction of the spirit.

It has been expressed as a fear that the supply of material—the production of essays and other subjects by the members—would be very likely a difficulty in the society proposed; but I cannot believe that it could fail through want of this support, if once fairly and properly working. My view of it rather is that, with a careful, spirited, liberal guidance at the commencement, and cordial attention on the part of a few leaders, the means of supply for material would soon admit of selection. With a hundred, or even fifty, young men earnestly engaging in such an association, surely the four-and-twenty subjects a year would be obtainable.

This society I would have to embrace the entire class of the young architect, from the Institute down to the youngest pupil. If any one be inclined to demur against his association, as a man in the omega of study, with the mere boy commencing the alpha, I would remind him that such argument would deprive the world of all its great ones—if it were beneath the dignity of a Socrates, or a Buonaparte, or a Washington, to associate with meaner men. Let it embrace the whole class, and upon a liberal spirit even then. For what is wanted is a society for this class, not like what our Institute is to the profession, but like what it ought to be.

The School of Design which I have spoken of would be simple in its nature. A proficient man takes charge of a small class of students for their instruction in Design. There might be several teachers for several branches, and junior classes and senior. The teachers' duty is to appoint subjects for design, and to criticise the designs presented. This is all I would propose as a commencement; but there might be classes for other matters,—construction, for instance, drawing, perspective, painting, practical work,—anything, in short, which might be found desirable. There are also many other amplifications which would fall within the province of architectural education; but a perfect School of Design would be of gradual, perhaps difficult, attainment.

This institution ought certainly to be supported by the Institute; but I fear we cannot expect it; and even if it were to be had, I should be suspicious at present of its government. I would connect it, therefore, with the Architectural Society which I have described. First, there appears no other means of obtaining that necessary support which the School of Design would thus obtain. Secondly, there would be a very valuable aid to the Society itself. Thirdly, I do not know where effecient instructors are at present to be had; and the Society would be, I believe, a speedy means of producing them,—for in six months I would expect a new school of architectural criticism to be established.

I have not been able to devote that careful study to my subject which is requisite, to be able to leave generalities for speciality and detail. My object has been, therefore, more to shew the grounds for the scheme, than to develop the scheme itself. The constitution of the society would have to be arranged carefully and deliberately. I would be exceedingly cautious in proposing at the present any decided principle of detail. But one or two passing observations might be made as a conclusion. The expenses of the Society ought to be as small as possible—the subscription money as nearly nothing as may be. Exclusiveness ought to be avoided carefully. Better to explode through liberality than to fall cold and dead through selfishness and scruple. I would also expect that teachers for the School of Design would be had for generosity and not fee—their trouble being made as small as possible, as much a pleasure as possible, and as much as possible an honour to be desired. Students' fees would be well to be nothing,—instruction free. Secret committee work must be none,—the government must be open, a management by delegates, not a dominion of rulers over subjects.

Now I have said what I have to say. I leave it for consideration and inquiry. For my own part I am only fully convinced that something of the kind I have described might

with great benefit be established; and I hope the moving spirits will be found, to carry it into effect, as a means, not only of the advance of our beautiful Art in the present generation, but also (it may be said without hesitancy) of its regeneration from its present obscurity, confusion, disguise, and error, to its true free height as one of the noblest works of the intellect of man.

THE BOND QUESTION.

Sir,—Will you allow me space in your publication to add a few words on the subject of *bond in brickwork*, so that your readers may have more views than one before them? In my humble opinion it should be laid down as a fundamental principle, that "no woodwork, either in the shape of bond, plates, or lintels, should be used in brickwork, and that wood bricks and the ends of timbers should be admitted as seldom as possible."

In order to supply the place of wood, I would adopt one or more of the following expedients:—

For Bond.

1. The brickwork should be carried up in English bond, in party-walls *at least*.

2. Two or more courses of *stone* or *slate*, set in cement, all the joints broken; this would apply particularly to ashlaring, and might receive the form of stringing courses.

3. Four or more courses of iron-hoop or vat hoop. It should be an invariable rule, whenever iron is used, either to have it *galvanized, painted, pitched and sanded*, or coated by one of the processes you have mentioned in recent numbers of The Builder.

4. Two or three courses of *tiles* somewhat after the Roman manner, but bedded in cement and the joints broken. The tiles might be made of the width of the wall, of any convenient length,—say from 2 to 3 feet, and from 1 to 2 inches in thickness. Perhaps these might be objected to in the *front* walls of buildings, but at any rate they might be used in the party-walls, or they might be *moulded* so as to form stringing courses, in the same manner as the stone or slate bond, and in that case might be made very ornamental.

5. Two or more courses of bricks formed in lengths of 2 to 3 feet, and the *whole width* of the *wall*. These, if bedded in cement and with all the joints broken, would form a very efficient bond.

For Plates.

1. Iron vat hooping or iron bars (*galvanized*) to which the ends of the timbers might be screwed or spiked.*

2. Cast-iron corbel plates, on which the wooden plates would rest.

For Lintels.

1. The arches over the external door and window openings might be formed the whole thickness of the wall, in which case no lintels would be required.

2. Wherever lintels were required, bars of iron (galvanized) might be used with discharging arches over them.

For Wood Bricks.

I think I have seen it stated either in The Builder or some other publication (but perhaps you or some of your correspondents can refresh my memory on that point), that an *incombustible* substance had been invented which might be very usefully applied in the place of wood bricks, being capable of resisting pressure, and possessing the nature of wood, inasmuch as nails might be driven into it without splitting it.

Ends of Timbers.

The use of cast-iron corbels for supporting the plates would get over this difficulty, and a very good tie might be obtained.

I have not said anything on the advantages of excluding a substance that is liable to *decay* and *fire* from brick and stone walls, considering it a self-evident proposition.

I am, Sir, &c., A Builder.

London, Feb. 4th, 1847.

* The contraction and expansion of iron by heat would render the use of bars of any size in brickwork very inexpedient.—Ed.

A PEEP AT LAHORE.

A recent French traveller describes Lahore, of which we have recently heard so much, as being surrounded by high walls and defended by towers and ravines, and gives a graphic picture of its sanatory state and condition. He says, when seen from a distance, no idea can be formed of the spectacle it presents within. Its present misery is as great as its past splendour. It is nothing but a mass of ruins; every where its noble mansions seem ready to fall to the ground. To adventure on foot through the inextricable maze of tortuous, infectious, dark streets, forming the town, obstructed, as they are too, by ruins, and filled with elephants, horses, and men, is almost impossible for a stranger. The streets are so narrow, that in many you may touch both sides as you pass. The houses, constructed of brick, are so high, so overladen with balconies and occupiers, and in such a state of dilapidation, that a blow would seem sufficient to overturn them, as it would the triumphal gates, under which you pass in going from one quarter of the city to another. To sum up all, the ground, which has never been paved, is a mere open sewer, as horrible to see as to bear; and is pierced here and there by deep holes, which, notwithstanding all the address which is displayed to avoid them, often cause the elephants dangerous falls. We should be glad to obtain the correct average duration of human life in this reeking cesspool, for the advantage of the sanatory agitation now going on in England.

TRUE FIELD FOR SCHOOLS OF DESIGN.

Sir,—I have just read the letter of "A Student," &c., in The Builder of 30th ult., on the much tortured and, it appears, everlastingly-to-be-misunderstood question of schools of design. The suggestions contained therein are valuable, and worthy of due consideration, but an idiosyncrasy appears to pervade all one meets with or hears on this subject,—it is the perfecting of a School of Design in London alone. Louis XIV. said, "*L'état—c'est moi!*" and the earnest and intelligent advocates of a reform at Somerset House appear to think, that *London is Great Britain and Ireland, with dependencies and colonies.*

Now, Sir, the question of schools of design out of London,—fixed in the great hives of manufacturing industry, is *the* national question; and whatever may be done in London, or however excellently things may be conducted in a school adapted to the wants of the metropolis, the "*pons asinorum*" of the matter has still to be got over—the education, adaptation, and productive powers of provincial schools. Even the committee, now or lately sitting, appear to have altogether neglected this point, and the rule of action appears to be,—"Get a good school in London, and all the rest will follow." This of course is anticipated out of the controlling power to be exercised by the authorities of the central school. It may not be amiss, therefore, to name three or four points for the consideration of all parties interested in the matter.

First. How far the provincial schools of design, placed in the numerous centres of varied manufactures, can possibly be efficiently directed from a necessarily limited sphere of observation like London (as regards their positive wants), even with all its advantages, artistic and mercantile.

Second. That some provincial schools have flourished and done their work satisfactorily, so far as regards the wants of the districts in which they were located, whilst the central school was found to be totally inefficient.

Third. That the unreasonable and untimely interference of the authorities of the central school with efficiently managed provincial ones, has resulted in bringing one of the latter at least, and that too the most important one, to the very unsatisfactory level of the former.

Fourth. That whilst affecting to look to France for a high and potent example, the fact has been overlooked, that the French schools are not necessarily controlled in their action by the metropolitan one,* and that the great School of Design of France is not that of Paris, but of Lyons.

Make the London schools what you like, from an infant drawing academy, up to an university of industrial art; train all the masters and teachers, directors and professors, you may require; drill them by searching examination before making an appointment; but after all, the great field of these operations must be Manchester and Birmingham, Sheffield and Glasgow, Paisley and the Potteries, or any other place in which positive manufacture is carried out by practical men anxiously waiting for artistic excellence. I am, Sir, &c.,

Manchester, Feb. 4. Geo. Wallis.

* See Mr. Poynter's Report on the French Schools.

KENSINGTON WORKHOUSE COMPETITION.

Mr. Builder,—Herewith I send you a list of the amounts of tenders for the erection of a new workhouse at Kensington. Much has been said at various times in your paper, respecting the disadvantages arising out of the present mode of competition; a stronger case than the present could not in my opinion be adduced of the necessity of a great alteration in the course pursued both by architects and building committees.

The adopted plan is one of the many sent, in answer to an advertisement limiting the amount to be expended to 9,000*l.*; and it was stated by the architect it could be carried out for 8,700*l.* Tenders were required, and when received they ranged from 14,000*l.* to 18,000*l.* The architect then stated that he had discovered that the person employed to take out the quantities had committed an error, and which occasioned the excess of difference between his statement and the tenders. The board of guardians, at the suggestion of the architect, employed him to take out the quantities anew; his estimate then was 9,800*l.*, and he assured the board that an eminent builder had offered to execute the work for that sum. But what is the result: the tender accepted, although estimated upon the *architect's own quantities*, is 11,020*l.* Comment is altogether unnecessary; I am content to leave the subject to the consideration of your readers, and remain, Mr. Builder,—Yours truly, G. H. S.

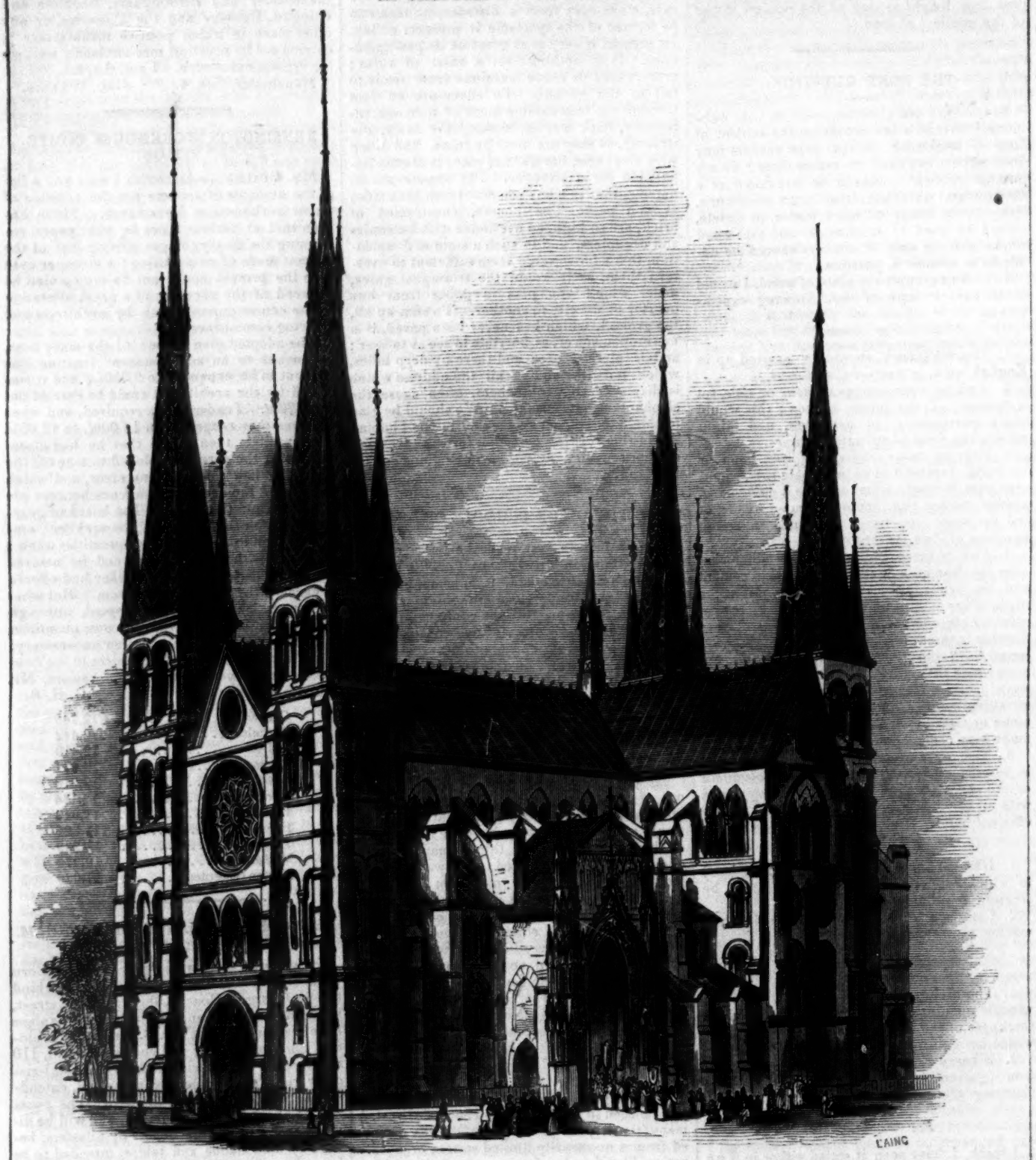
Cooper and Davies	£12,746
Nicholson	12,442
Jeffries	12,419
I'Anson	12,231
Sissons	12,219
Curtis	12,134
H. W. Cooper	11,912
Higgs	11,326
Trego	11,289
Wilson	10,970
Burton (accepted)	11,020

NEW CORN EXCHANGE, BIRMINGHAM.

It has been determined to erect a new Corn Exchange in Birmingham, immediately behind the St. George's Coach Office, in High-street, between Carr's-lane and Castle-street. The plans have been prepared by Mr. S. Hemming, architect, and the building will consist of a hall, 110 feet long by 40 feet wide, lighted by a semi-circular roof, surmounted by a lantern, extending the whole length of the hall. The room will be about 50 feet in height, and will be divided into side compartments by pilasters, between which stands and tables, intended to be let to farmers and dealers, will be placed. It has a glass roof of semi-circular shape, as the one best suited to admit the greatest quantity of light. According to a local paper, this spacious room will have two doors, one leading from a vestibule, with columns and ornamented ceiling, at the entrance of St. George's-court, in High-street, the other with a still larger vestibule at the Castle-street entrance. A porch, ornamented with pilasters of the Roman Doric order, will form the High-street entrance; that by Castle-street, which will be the principal front, will be enriched with eight columns, and ornamental recesses leading to the vestibule and to the floor beneath, which it is proposed shall be appropriated to the exhibition of agricultural implements. The building is of the Roman Doric order, in cement. The extreme length of the building, including porch, vestibules, and hall, will be 167 feet, the width varying from 37 to 40 feet. The builder is Mr. Briggs, and the cost will be 5,000*l.*, the expense of the land being nearly the same sum.

CATHEDRAL OF NOTRE DAME, CHALONS-SUR-MARNE.

AS PROPOSED TO BE RESTORED.



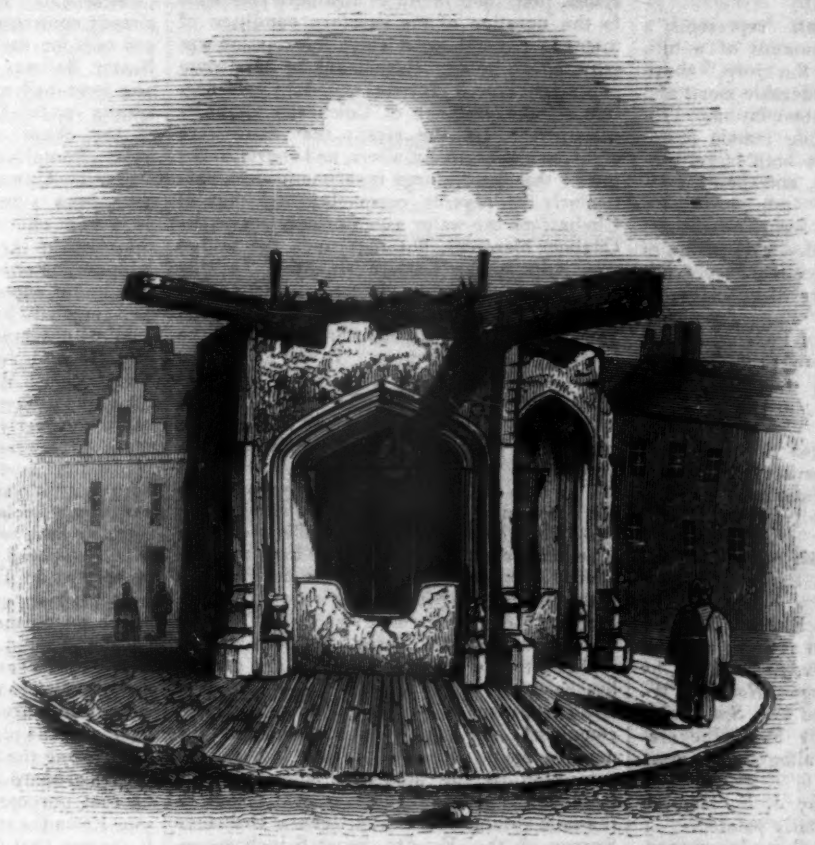
CHURCH OF NOTRE DAME, CHALONS-SUR-MARNE.

The city of Chalons is situated on a fertile plain, watered by the Marne, the Mau and the Nau. It still retains many features of its ancient strength and importance; and the wall which fortified it during the turbulent middle ages still partially exists. The Hotel de Ville is an attraction to tourists; but the principal feature of the place is the fine Church of Notre Dame, which adorns it, and which, to use the words of the Curé M. Champenois, "for the regularity of its plan, for the purity of its style, for the grace and majesty of its details, takes an honourable position among the most remarkable edifices in France." This beautiful church, founded in the twelfth century, presents many interesting features of the transition between the circular and pointed styles of architecture, and abounds with beautiful details. The stained-glass windows, executed in 1520, are one of the sights of the place; the rood-loft is also exceedingly beautiful, and the portal is fine. But the great external feature of the church was the four spires, and the pinnacle in the centre of the roof, which were destroyed in the revolution of 1793, only one surviving the ravage. They were covered with lead, and were exceedingly light and elegant in design. The present curé, whose words we have quoted above, with a laudable desire to re-instate its ancient glories, has issued a circular requesting subscriptions towards the restoration of what he justly considers "a monument of the nation's glory." There can be little doubt of the propriety of thus directing attention to the reparation of much that is beautiful in the national monuments of France. Some of the restorations now going on there are worthy examples, which all true lovers of art would be glad to see followed in England as well as in France. Our engraving represents the church as it will appear when restored.

IMPORTANT CHANGES IN THE ROYAL SOCIETY.

For two years, at intervals, the council of the Royal Society have discussed the desirability of altering the mode of electing fellows, with the view of limiting the number of new members to be annually admitted, and preventing the introduction of persons whose claims are trifling, and they have at last come to the following resolution on the subject. After the commencement of March next, as we understand it, there will be but one election, of fifteen fellows, in the year; the first being in March, 1848. The names of candidates will be suspended the whole year, and just preceding

GOTHIC WELL, IN GHENT.



the election, a list of all candidates will be sent to every fellow, together with the names of fifteen recommended by the council for election. It remains to be seen whether or not the members generally approve of this plan, or even will acknowledge the right of the council to make this change, without first appealing to a general meeting.

WHY REMOVE THE STATUE?

This question, long ago answered, is again put, in a four-leaved pamphlet, by one who calls himself a friend of Sir Frederick Trench, and begs the public not to let themselves be bullied out of their opinion by the Academicians. If the writer really wishes an answer to his question, we advise him to look through the last volume of our journal, and if he does not find there sufficient sound reasons for its immediate displacement, we must think he has voluntarily closed his mind against conviction. Reasons for its remaining where it now stands he has none, excepting the assertion which we now unhesitatingly contradict, that the public is *pleased* with its position. The arch spoils the statue, the statue spoils the arch. Singly, each might be made a satisfactory public monument: together, unnaturally conjoined, they disgrace the country and harrow the feelings of every observer who has a just perception of harmony or the want of it. It is to be hoped that, after the present severe weather leaves us, not a week will be suffered to elapse before it is taken down. The western entrance to London has been disfigured through it long enough.

Heat Without Fuel.—Important as cheap fuel may be, to be able to do without it altogether is more important still. A Hungary chemist, perhaps a cold one too, has taken some promising steps towards making this possible. He places in contact two iron and one copper cylindrical plates, highly polished, turning on an axis at the end of a lever, with a balance weight at the other end, to keep the plates in contact, when, by means of very simple apparatus and trifling exertion, a glowing red heat may be produced in five minutes, and maintained with ease. Chalk is nothing to this.

GOTHIC WELL IN GHENT.

We transfer from our sketch-book the annexed representation of the ancient enclosure surrounding a well, in Ghent, as an instance of the artistic skill exhibited by the old architects in treating even small and unimportant subjects. In its present state of ruin this well forms an exceedingly picturesque and curious object. It is situated in a part of the city little visited by travellers, known as the Old Citadel, where also are the remains of a very curious early church, to which we may refer on some future occasion.

MODERN WORKS AT THE BRITISH INSTITUTION.

It appears to be generally understood that there is something radically wrong in the proceedings of the British Institution; the government rests in two or three irresponsible hands; injustice is done both in the selection and the hanging; and spiteful acts, as regards sales, are complained of by artists, which are as incomprehensible by those not in the secret as they are disgraceful if true. A reform is anxiously looked for, but whence the worker of it is to come seems as yet a profound mystery: a closer and apparently more impenetrable citadel than that which he would here have to enter can scarcely be conceived. Let us suggest to the directors, that is, to the two or three (if so many) who, according to report, alone take some little part in the affairs of the institution, to begin the change themselves from within, and endeavour to bring the institution into a more healthy state.

To look for a good collection of pictures under present circumstances is vain; and it was with little surprise, therefore, that we found the exhibition, which opened on Monday last, exceedingly unsatisfactory. Many of the elder artists are absent, and the works of the younger ones shew little advance. The want of reading and general knowledge, on the part of the majority of artists, is painfully apparent, and perhaps want of industry not less so. Having been once in any degree successful in the choice or treatment of a subject, they think it unnecessary, if not unwise, to tax their invention or recollection for some years to come, and go on issuing fresh editions of the former work, with constantly diminishing effect; and it is seen that, instead of following an art, they are simply practising a knack.

A true artist is a poet, expressing fine ideas in a fine manner. The thought exhibited in a picture is the first point to be inquired into. That which has cost no thought on the part of the painter will excite none in the spectator. In proportion as the idea developed be lofty and ennobling, so will the character of the picture be high. No skill in painting, no power of execution, will compensate for want of invention, or entitle a mean thought to rank with one that is noble though less well expressed.

We must confine ourselves, at present, to mentioning briefly some of the more prominent pictures in the collection.

1. *A Mountain Road, North Wales*, by J. Linnell, is a highly elaborated landscape which possesses much excellence, and is deserving o examination.

3, *The Lovers' Walk*, F. Danby, a moonlight picture with some of those peculiar effects over which this artist has acquired great control. Though it will not please the majority, it is a work of genius.

6. *The Holy Well*, by F. Goodall, a hacknied subject treated with great feeling. 23, *Irish Courtship*, a larger picture by the same artist is a charming work, though it displays no advance on former works by the same able hand. The girl's face is a perfect sunbeam, gladdening all who look on it, and the contrast between the two suitors is so forcibly expressed, as to suggest a story for the picture and lead one to speculate on their future.

13. *Hatton Forge, a scene on the River Lune*, by W. Linton, is a fine bit of nature.

21. *A Venetian Letter-writer*, by J. Inskipp, represents two girls, the size of life, dictating a reply to a scribe, and notwithstanding that the costume scarcely bears out the title, has high qualities as a picture. 53, *Spring-tide*, and 239, *Fruit-girl*, both by the same painter, will not be passed unnoticed. The directors have not treated Mr. Inskipp well. They ought to make much of him.

30. *Market-place, Coutances*, the only picture exhibited by D. Roberts, R.A., though very charming, is scarcely up to this excellent artist's own mark.

58. *The approaching Footstep*, by F. Stone, consists simply of the figure of a girl (often painted before by Mr. Stone, or we mistake) leaning against a bank, in expectation. The start of a spaniel, she holds in her arms, gives token of the approaching comer. It is a covetable work.

66. *Morning*, by J. Sant, represents a youth, of life size, on the summit of a hill, with a lark, "the herald of the morn," above his head. It possesses considerable merit and entitles its author to commendation. 170. *Evening*, and 185, a reclining female figure under an artificial light, are both large pictures by the same gentleman, and shew a considerable advance.

67. *Welch Mountain Scene, autumnal cloudy weather*, by H. Bright,—a repetition of his *chef-d'œuvre:* very excellent. He has also some smaller landscapes of considerable excellence.

83. *The celebrated Oak in Polstead Park;* 162, *An old Avenue* (once more); 180, *The Cottage under the Hill;* 442, *Landscape with Figures and Cattle in a Boat;* are all by F. R. Lee, R.A.

150. *Rizpah watching the dead Sons of Saul*, by J. C. Hook, is a meritorious attempt in a high walk. The indications it gives of study lead us to augur well for Mr. Hook's future progress.

148, 184, 340, 350, and 432, representations of fruit and still-life, by G. Lance, are quite perfect in their class.

214. *Bianca Capello*, by A. Elmore, A.R.A., deserved a better place than it has; and the same may be said of 244, *Study of a Head*, by C. Baxter; 379, *The Campagna, Rome*, by W. Linton, a capital picture; and 443, *Scene from Shakspeare's Henry IV.*, by F. B. Pickersgill. Indeed, the hanging altogether is most discreditable.

259. *The frugal Meal*, by J. F. Herring (three horses' heads) is capitally painted.

267. *Glen Falloch, from above Inverranan*, by J. D. Harding, is a charming little landscape, full of beauty.

295. *The Death — Stag Hunt in the olden Time*, by R. Ansdell. A powerful representation of the stag's last struggle with the dogs, calculated to maintain the reputation Mr. Ansdell acquired in London by his pictures of last year. The stag and dogs are full of vigour.

303. *Reposing after Bathing*, by W. Etty, R.A. Mr. Etty is unquestionably a great master, and has much advanced the art. Although this is but a small sketch, when viewed at its proper distance it is a perfect blaze of colour. Two other pictures by the same painter are less striking.

359. *A Break in the River*, by T. Creswick, we seem to recognise as an old acquaintance, and a pleasant one.

365. *The last Moments of Mary Queen of Scots*, by Alex. Fraser, stands prominently out in the company that surrounds it, as one of the very, very, few historical pictures to be found in the gallery.

438. *Morning, the arrival of a Greenland Ship, Shields Harbour*, by J. W. Carmichael, is a capitally painted sea-piece, with much life.

451. *Frost Scene*, by C. Branwhite, though scarcely so good as similar works last year, is nevertheless a well-painted picture calling for commendation. We cannot say so much for his other picture, 260.

478. *Mary at the Sepulchre*, by H. O'Neil, has poetry, as well as skill, in it, and should have been better placed.

485. *The First Death*, by E. B. Morris, is a large picture, with figures the size of life, commendable for its intention.

J. Holland has some brilliant pieces of colour; and J. D. Wingfield, G. E. Hering, G. C. Stanfield, Jun., A. Gilbert, H. Jutsum, and others, exhibit some very nice landscapes.

We have only space to say further, that the exhibition consists of 543 paintings, and 18 pieces of sculpture; and that 400 pictures were returned for want of room. Is it possible these were all worse than the majority of those now exhibiting?

Glass.—A patent has just been taken out by Mr. Parkes, of Peckham, Surrey, for making coffins of glass by a mould, or of thick plates of china joined together by a durable cement, or of wooden cases lined with plates of glass, united by a mixture of fused glass and borax.

NOTES IN THE PROVINCES.

The commissioners or surveying officers appointed to visit Colchester relative to the expediency of the Improvement Bill applied for, in opening the business of the commission, stated, that their inquiries also bore reference to the question of the sanatory condition of towns in general, upon which information was required to enable Parliament to pass some general measure. It was stated in evidence, that all the drainage of Colchester might be concentrated in the river; that there were eighty to ninety streets, alleys, and courts, in the town; that the drainage is very imperfect, particularly as regards cesspools; and that at Chelmsford the water used to rise 3 feet on the Chelmer meadows, but that since the bridge was built by the Eastern Counties Railway Company it has risen 8 feet. A clause was proposed to give the Channel Commissioners power to make a sufficient bridge in case the company should not do so. It was also stated in evidence, that nearly ten miles of gas mains have been laid through eight miles of streets and roads. Cesspools at the end of the drains where they emptied themselves into the river, so that the sediment could be cleaned out by the farmers and used as manure, were proposed for adoption in the bill, and were admitted by the officers to be worthy of consideration.——The town council of Colchester have resolved that it is expedient to join the county justices in the erection of a pauper lunatic asylum.——A fund for the erection of Pawnbrokers' Almshouses at Stratford, Essex, has been already realized to the extent of 3,000*l.*, and ground has been purchased for a site.——The new Ordnance map of Southampton, which is just completed, will, it is said, be one of the most valuable articles of property in the possession of the municipal authorities. It is drawn up on a scale of 60 inches to the mile,—the scale of the General Ordnance Survey of the Empire being 6 inches.——The Castle-gate Chapel, at Nottingham, the oldest dissenting chapel in the town, is to be enlarged.——Part of one of the pinnacles of St. Thomas's Church, Dudley, was recently blown off by the wind, and broken to pieces during divine service.——The church at Soberton has been restored and re-opened. The gallery has been removed, three fine arches again brought into view, and this ancient edifice has been restored to something like its former state.——The parish church of Bebington has been re-opened after being extensively embellished and repaired.——It has been determined to postpone the Bristol Improvements till June 1848.——The Bath town-council mean to apply to the Treasury for a confirmation of the grant of a piece of ground in front of St. James's Church, for the improvement and enlargement of that edifice, on a plan proposed by the rector, and approved by the parish.——The bill proposed for the improvement of Taunton contains 300 clauses!——It is intended to erect a new church at Rowbarton, near Taunton, from a design by Mr. William B. Gingell, architect, of that town. The new edifice is to be in the pointed style of the time of Henry III., with a broach spire, open timber roofs, &c.——The repair and restoration of the parish church of West Lavington, Wilts, is talked of.——The munificent sum of 1,000*l.* has been offered by Mr. R. Richards, of Tregadwgan, towards the rebuilding of a new church in the parish of Llanfihangel Abergowin, the present church being very inconveniently situated.——The Royal Consorts have each given 20*l.*, and the Queen Dowager 10*l.*, towards the establishment of new public baths and washhouses for the poor at Liverpool. The Green-lane Water-works there are now completed, with an engine filling the cooling ponds at the rate of 900 gallons per minute. The Kensington reservoir, which will hold 10,000,000 gallons, was expected to be filled in a few days, when not only will there be a constant supply of water in the warehouse and other districts of the town, but from the height of the reservoir (170 feet above the level of the Exchange) fire-engines now will be often unnecessary in suppressing fires. The sewers, too, will be scoured out whenever they require it, and the streets in summer will be effectually watered.——The first stone of a new church to be built at Hagbergham Eaves, near Burnley, was laid on New Year's day. It is to be in the early decorated style, with a tower and broach spire, and open benches for 500 persons. Messrs. Weightman and Hadfield, of Sheffield, are the architects. Messrs. J. P. Kay, Shuttleworth, and W. Dugdale are the chief benefactors of the work.——A new iron-foundry for casting is about to be erected near Chesterfield. The proprietors are said to have already contracted for a portion of the chairs and rails for the Ambergate, Nottingham, and Boston Railway.——A new opposition to the new town-hall and market scheme has lately sprung up at Doncaster.——The first stone of the chapel of St. Michael, at Carleton, near Pontefract, was laid on Tuesday week.——Upwards of 2,000*l.*, it is said, have been subscribed towards the erection of a new church in the populous district of Cookley, in the parish of Wolverley, near Kidderminster.——The Newark Mechanics' Institution expect to have a building of their own erected by subscription.——An astronomical observatory is about to be erected by Mr. Edward John Collingwood, at Lilburn Tower, near Wooler. Elevational and sectional plans have been prepared by Mr. James Moffat, formerly pupil of Mr. Dobson, architect, of Newcastle. The dome is to slide round on friction wheels.——The parish church at Wolsingham is to be partly rebuilt, and new schools are to be erected at Towlaw. Tenders have been called for in both cases.——The Gateshead new Mechanics' Institute is to be erected in West-street, where the borough is otherwise extending.——In the Edinburgh town council the state of the Greyfriars burying-ground has been brought under notice. It appears to be far too small for the crowds who are there interred. The Greyfriars' is the only burying-ground in the city for the poor, and the idea was thrown out that the duty of interring the poor should devolve upon the parochial board, and that a new burying-ground for that purpose was indispensably necessary.——From the statement of the Prime Minister, it appears that in Ireland the Government are giving employment to 500,000 men, who are supposed to represent, with their wives and children, upwards of 2,000,000 of the population. These 500,000 men include a staff of 11,587 officers, chiefclerks, check clerks, pay clerks, &c. The expenditure upon these officers, clerks, and labourers is 172,000*l.* weekly. This is, as near as possible, at the rate of 7,000,000*l.* per annum.——According to the *Daily News*, a new trade is about to originate in Galway, which, if well worked, would afford employment to great numbers of the poor. The new enterprise consists in supplying broken granite for the formation of roads in and about London. The granite procured from Guernsey at present costs 11s. 3d. a ton, which covers all charges, including the actual freight of the vessel for the special purpose. Now the Galway people believe, according to our contemporary, they could undersell Guernsey by at least the difference in the freight, as numbers of vessels sail from that port to London in ballast.——Among other presentments passed at the city of Waterford presentment sessions, was one of 1,000*l.* for a public garden.

FOREIGN ARCHITECTURAL AND COLLATERAL INTELLIGENCE.

Bad Prospects for German Railroads.—It is stated that there are some proposals making at the German Diet—to place, in case of war, all the lines under the *control* of a *military* commission, presided over by an Austrian general. Prussia, however, has protested against this encroachment on the freedom of public traffic.

A Humanitarian Club—has been established at Brunswick, whose aim it is to devise means how the impediments to man's welfare could be best removed, and the feelings of true humanity fostered amongst the working classes.

The King of Bavaria—outstripping even the speed of the press, has just resolved on erecting statues of two ladies, one from the ranks of the people,—Maria of Brabant, and Agnes Bernauer; these monuments are to be placed on the craggy castle of Donauwörth and the bridge of Straubing.

Embellishments of Paris.—Mr. the Préfet de la Seine has addressed to the Home Secretary, for the approval of government, a plan for the alignment of the Place St. Michel, at Paris, near which a prolongation of the Rue

Soufflet is to be effected, which will extend up to the Palace of Luxembourg, on the side of the Rue d'Enfer. The iron railing, which has been already carried up to this point, will be extended to the present point of junction.

Prizes to Fire-brigade Men at Paris.—On the 1st of this month all the detachments of the above corps (*Sapeurs-pompiers*) assembled in the barracks of the Rue Culture Sainte Catherine, in complete parade order—to witness the distribution of medals to those men who had, during the last half-year, most distinguished themselves in affording relief in cases of fire. After a short address of the commandant, five medals were distributed—one to an officer, and four to men of the rank and file.

Enlargement of Prisons and Penitentiaries in Austria.—The provincial house of correction and the foundling-house have to be increased at Prague—while the number of paupers, and the unwillingness of the inhabitants to support them, are also on the rise.

Terrible State of the Public Roads in the South of France.—The late inundations, conjointly with the carriage of an unusual quantity of bread, have ruined the public roads of Marseilles, Avignon, and Arles. That from Avignon to Arles is completely relinquished, and no vehicle can pass it without great risk. Orders have been sent for the immediate reparation of these lines of communication.

Chinese Samples of Industry.—The Secretary of State for Commerce and Agriculture has forwarded to the different chambers of commerce in the provinces, copies of the reports of the commissioners sent to China for the purpose of studying their state of industry. These reports, accompanied by original samples, will guide the French manufacturers to what will be best calculated for the China market.

New System of French Penitentiaries.—As it had been at first found, that the prison of the Rue de la Roquette (conducted on the exclusion system) exhibited a great proportion of young people dying under this treatment, a number of ingeniously planned walking spaces (*promé-noirs*) have been constructed to the effect, that every one of the 480 prisoners are now taking an hour's exercise every day, without, however, being able to meet each other. Since these *promé-noirs* have been erected, the mortality has decreased in the proportion of 3¼ : 1.

DRAINAGE OF IPSWICH.

The council met a short time since, to appoint a committee to consider the propriety of proceeding with a proper system of drainage for the town to be provided for by a sufficient rate, without waiting till forced by Government into a probably more expensive measure, for which loans at 4 per cent. interest would be requisite. The mayor introduced the subject of plans made out by Mr. Fleury, architect, for the consideration of the council, according to which, a sufficient system of drainage might be effected at an expense of about 10,000*l.*; whereas it appeared probable that grants from Government to an extent of 20,000*l.* to 30,000*l.* would be necessary, without a special rate and a previous well-economized system, to cover the heavy expense of a commission of inquiry and a system of drainage forced upon them. A report by Mr. Fleury was read, in which it was pointed out that the fall or declination of the town was much superior to that of London in the main, and would admit of considerable economy in the size of sewers. Drain pipes, however, were recommended in certain circumstances as less expensive than brick sewers. Strong 9-inch, 12-inch, and 18-inch drain-pipes might in many cases supersede the necessity of building brick drains. Where those latter were necessary, sewers of an oval form, with the lower part semi-elliptical and the upper semi-circular, were recommended as best for affording depth of current favourable to good flushing. And besides, the oval sewer giving a sectional area leaving a higher ratio to its periphery than any other figure does to its boundary line, the circle excepted, there is much economy of materials in the construction of oval sewers. Radiated bricks would be a further saving in work, mortar, and consequently expense. The lower bed of the sewer should be built with sharp sand and stone lime, to save cement in the lower joints. The smallest size recommended would be 1 foot 9 inches, by 2 feet 6 inches clear; the largest 3 feet 3 inches by 2 feet 2 inches, the latter with man-holes. Effluvium traps, flushing-doors, &c., were also of course attended to in the report, and it was hinted that a question might arise as to saving the sewerage for agricultural purposes. The town clerk recommended that nothing should be done without previous acquaintance with the Government plan. The committee for consideration of the subject was then appointed to report their opinion to a future meeting of the council.

DEATH IN ST. JAMES'S.

"A RETIRED churchwarden,"—report says the Hon. Frederick Byng,—has issued "An Address to the Inhabitants of St. James's, Westminster," on various local circumstances affecting the health of rich and poor, and which ought to have a powerful effect. If such a list of abominations as he points out is to be found in the parish "where the court is held, where palaces, and palatial club-houses, and the mansions of the great, the rich, and the powerful are situated, where the bishop of the diocese and a large staff of the clergy reside," what must be the state of things in other parishes evidently much less favoured.

The drainage the writer considers bad, for "It would appear that the greater portion of the sewers may be compared to an elongated cesspool! For the advantage of living over, and inhaling the noxious exhalations from this wide flat-bottomed cesspool, the inhabitants of the district have been taxed, in the course of the last 22 years, to the extent of 565,000*l.*, exclusive of the enormous outlay of upwards of one million, calculated to have been expended by private individuals, in new sewers and drains. Scarcely credible as this statement may seem, not the less startling is the fact, that simply to correct the errors of construction, on which such sums have been lavished, a rate must forthwith be levied to produce 40,000*l.*, and a like rate continue to be levied for several years. Nothing can shew more clearly the mal-construction of the sewers in question, than the fact, that upon examination of the deposit of soil and filth accumulated in them, the lowest calculation of the sullage amounted to 2,500,000 cubic feet. The sewer water also, mixed with the exudations from cesspools, is represented as filtering through the porous walls of the sewers,—percolating the earth,—sapping the foundations of the houses,—rising in the lower walls,—and tainting the atmosphere with gaseous fumes of the most noxious description.

Until recently, though heavily taxed in common with their neighbours, the inhabitants of St. James's Place have had to put up with a sewer so utterly inadequate as to render cesspools absolutely necessary. In excavating for the new sewer, besides five others in its line, no less than three cesspools were discovered in a single house. Though fresh air might enter during the day, in what state must this house have been during the night, with every modern contrivance to exclude ventilation, and the vapours from these poison-pits ascending and vitiating the air of the whole interior. Before 1841, the greater part of Piccadilly was without a sewer at all! These facts are cited, because, if this has been the state of things in two such respectable localities, it is easy to imagine the neglected condition of less important parts of the parish."

The state of some of the cow-sheds and slaughter-houses in this parish is abominable, and some of the close courts and alleys present such scenes as defy description. The simple fact, that in one district, St. James's-square, the proportion of deaths to population is one in ninety; while in another, and not the worst, the Berwick-street district, it is one in forty-two, speaks volumes. We shall be glad to see in every parish throughout the metropolis, some other "retired churchwarden" making a similar examination and exposure. "If without health, the rich man is poor, what must the poor man be?"

THE ACADEMY GOLD MEDAL, and the Discourses of Reynolds and West will be given for the best "design for a Gothic church;" the whole comprised in one general and regular composition. The design is to be as large as an entire sheet of double elephant will admit, and to consist of a plan, elevation, section, and perspective view. A silver medal will be given for the best figured drawing of the "Entrance and interior of the Temple Church."

RAILWAY JOTTINGS.

DEPOSITS for the present session to the amount of 4,200,000*l.* have been placed, in compliance with the standing orders, to the credit of the Accountant-general of the Court of Chancery. More than half of this sum consists of stock and exchequer bills in nearly equal amounts. Several of the companies, it is understood, will be large losers by their recent Exchequer bill investments.——The Eastern Counties Company are enlarging their goods depôt at Bethnal Green to nearly three times its original extent. To make way for new warehouses a number of miserable thoroughfares crowded with wretched dwelling-houses have been of late demolished. The application of this company to Parliament for an extension to Guildford-street, appears to have led in some way to the mistaken idea that a terminus has been already formed in Gray's-inn-lane, out of a prison.——Since a new town has sprung up around the Paddington station of the Great Western Railway, extending to the Birmingham line at Kilburn, a subscription has been set on foot for the means of erecting another new church. The new church in Hamilton-place, about the centre of this new district, is about finished, and will be consecrated during the present month. Some difficulties have arisen between the builder and the architect. Another new church is to be erected adjacent to the Regent's-park, where the Commissioners of Woods and Forests have set apart a site for the purpose.——In the sinking of shafts at Birmingham, for the opening of the tunnel to the intended central station in New-street there, one of the superintendents was nearly suffocated at the bottom of a shaft, by inhaling the sulphur from a blast of gunpowder, and unfortunately, while being hastily withdrawn, fell midway from the top, and was frightfully injured. Some other *test* than the presence of a human being ought, in the first place, to be applied in such cases, as it easily could be, by transmission to the bottom of the shaft, and withdrawal for examination, ere a human life should be needlessly risked. The gaseous results of the explosion of gun cotton might perhaps be found to be more easily dissipated than those of gunpowder, and hence less dangerous.——The tunnel at Dorchester is progressing under disadvantages of no ordinary kind. The sub-contractor, after laying out some thousands, it is said, beyond the amount of his undertaking, has been obliged to throw up his contract. One great shaft is alleged, "by no incompetent judges," to have been quite unnecessarily sunk, and two almshouses, at the rear of which another "immense shaft" has been opened, have themselves, too, quite as unnecessarily sunk—"from the treacherous nature of the soil underneath," it is said, but primarily and more correctly, as it probably should have been said,—from the treacherous undermining of the "immense shaft in their rear."——The South Wales Company, like another of whom we had lately occasion to speak, are urging on their contractor, and affording him too good an after excuse for defective works and probable disaster, by the temptation of "a large premium" for the completion of the works still earlier than the limits of the period which even the interests of all concerned must have originally prompted them to limit already, as far as possible, and perhaps further than prudence, if not also further than true interest, would have prompted.——The area of the central terminus at Bedford has been staked out by Messrs. Tattersall and Walker, C.E., and according to the *Bedford Times* "will be of most extraordinary extent. The Company," it adds, "have probably purchased sufficient experience to understand the meaning of 'come first, served first,' and it needs but little foresight to predict that many of us will see a larger town the other side of the Ouse, than 'Poor old Bedford.'"——It is expected that henceforth "one of the greatest boons a railway could confer" on Bedford, will be the reduction of the price of coals, at one sweep, from 1s. 9d. per cwt. down to 11d. Messrs. Stephenson and Co. appear to have been prepared beforehand to confer on the inhabitants a graceful foretaste of this future benefit, and to prove to all, whether interested *pro* or *con*, that such was one determinate end to be thus at once accomplished. They had 1,000 tons of coal at Fenny Stratford, ready to pour into

Bedford so soon as the way was clear.——Great part of the wooden viaduct in course of erection at Denby Dale, on the Sheffield and Huddersfield Junction Line, has been literally blown down by the wind; and such was the depth which the supporters (twenty-seven in number) had to fall (namely 100 feet), that the strongest were broken to splinters. The damage is estimated at about 5,000*l.*——Another insatiable bog near Bingley, described by the *Globe*, is at present hungrily at work, devouring "sixty tons of earth and stones every hour of the day,"—a liberal contribution, in the thankless administration of which, notwithstanding previous experience and advice, and in spite of the discouraging fact that "all is swallowed up every morning," men and horses are engaged, as well as steam, and all to no end, of course, as heretofore. "It is a question at what time it will be completely filled up," which had better be asked at Stowmarket or Chat Moss, where, as our readers, at least, well know, heavy matters of a similar sort were, in like manner, at first so industriously poured into the insatiable gulph, and where, as in the present instance, the inevitable consequence was merely this, that the heavy matter thrown in sunk down to the bottom, forcing up the lighter bog above it, to a higher and still higher level, in exact proportion to the quantity of stones and earth thrown in. And this the bog would probably in every case continue to do, were the accumulations of heavy matter continued to a sufficient extent, until its equilibrium would be overturned, when, of course, it would become one of those fearful and strange phenomena, a moving bog, spreading itself abroad, and swallowing up every thing in its way, until it attained to another settled level.——The South-Western Scottish line,—the Glasgow, Dumfries, and Carlisle,—is making rapid progress in Ayrshire. The centres of the great bridge over the Ayr are now in, and give a good idea of what this great structure will be, as they are seen towering far above the tops of the highest trees which grow at the top of rocks 100 feet in height.——An abuse in the treatment and disposal of tenders for 8,000 tons of railway iron, by a German company, to the prejudice of three parties in England tendering, was exposed by the *Times* in its City article the other day, as one which, on national grounds, requires immediate publicity. The prices stated by the English parties, on special request, were 10*l.* 10s., 10*l.* 5s., and 10*l.*, per ton; but the directors of the German company, instead of completing the contract with the English party offering at the lowest price, only made use of that offer to induce the agent of another party to reduce the amount of his tender by 7s. 6d. per ton, thus bringing it 2s. 6d. below the 10*l.*, and upon this adroitly concluded an agreement, which is likely to injure German companies themselves in future as well as English ones at present.

STOCKPORT IMPROVEMENT BILL.

Two surveying officers, an architect, and a barrister-at-law, have been sent by the Woods and Forests to Stockport, where they have made preliminary inquiries relative to the improvements there contemplated, which, according to the *Stockport Mercury*, comprise four bridges with streets connected, to cost 19,072*l.*; widening, and otherwise improving streets and opening new ones, and roads, 20,101*l.*; besides which it is proposed to supply a deficiency in the quantity and quality of water by an arrangement between the corporation and the Manchester and Salford Water Works Company on the one hand, and the Manchester, Sheffield, and Lincolnshire Railway Company on the other; the latter to supply surplus water from extensive localities in Derbyshire and North Cheshire, and the former from their reservoirs, fed from their sources in Lyme Park. Evidence was led to shew that by the present company, whose supply is chiefly from artesian springs and bore holes, only 4,000 out of 12,000 houses had a limited supply, out of 259,863 gallons a day; whereas, for a population of 61,000, twenty gallons a day on an average, for each individual, or 1,220,000 gallons a day in all, are requisite for sanatory and other purposes. The immense difference is accounted for, partly by the deficiency of supply and partly by the irregular and expensive addition to that supply from other sources than those of the company. A clause in the proposed bill, prohibitive of smoke, was also discussed.

THE PROVINCIAL GAS MOVEMENT.

The expiry of another week brings with it another series of notes to chronicle on a subject which appears to be exciting an interest surprisingly general, and a determination as remarkably unanimous in favour both of the establishment of gas-light where it has not hitherto been, and of the thorough reformation of the quality, the quantity, and the expense of it where it hitherto has been, long a source of enjoyment or annoyance, or both combined.——Arrangements are in progress at Birmingham for the lighting of that part of the parish of Edgbaston which is within the boundary of the parliamentary borough.——Two commissioners have been at Runcorn making preliminary inquiries as to the gas company's bill for the supply of additional townships in this "main outlet of the internal navigation of the country." There, at present, forty-two streets and courts are partially lighted with gas, both within and without, at 7s. 6d.—or, for 130,000 feet upwards, at 4s. 6d—per 1,000 feet.——The Liverpool (incipient) Guardian Gas Company are exhibiting, just now, a gas-meter said to be so simply constructed, that any consumer can check the quantity consumed without official interference.——The impurity and feebleness of the gas-light at Wakefield, as well as its high price, and its deficient quantity, have at length aroused the inhabitants to a determination to support the bill of the proposed new company there, in preference to that of the old, also applied for. They very naturally think that from the local situation of Wakefield, in the very midst of an excellent coal-field, gas ought to be as low, if not lower, in price, and as good, if not better, in quality there as any where else. The grievance at Newcastle, however, as well as there and elsewhere, appears to shew the fact, at least, if not the inference, to be the very reverse.——The Wakefield parish church clock is lighted with gas at the expense of the drapers' apprentices and assistants there.——The surveying officers have made the inquiries at Shipley and Bingley, already referred to in our previous notes. Bingley, with 5,000 inhabitants, has its gas yet to come, as Shipley with 3,000 also has; and strong cases were made out in favour of the passing of the proposed bills for both these thriving districts.——At Cockermouth a public vestry has voted 200*l.* for lighting the town for the next twelvemonths.——The Gas Committee at Newcastle, it appears, lately proposed to purchase the present company's works at 50 per cent. advance on their original property, but fortunately the company rejected the offer; since which the committee has found that new works can be provided for about one-half the sum thus offered. A correspondent of the *Gateshead Observer* states, that one reason why the gas is so bad in such a locality appears to be the improvidence of the company, in not supplying themselves with a stock of good coals when the collieries, as they usually do, cease working for a time at the close of the year; so that they are compelled to use all sorts of inferior rubbish! The vulgar but shrewd and truthful adage, that "the shoemaker's wife is ever ill shod," was never perhaps more curiously illustrated than in the present instance. In Edinburgh, where the gas is made from this very coal, the gas is so pure, that it may be burnt in every room of a house—and indeed is frequently used even in bed-rooms. Many houses, even of the lower orders there, and at Glasgow, having one or more (some all) of their rooms fitted up with gas burners, for the sake of economy as well as of improvement.

Master Carpenters and New Buildings Bill.—On Thursday, the 4th inst., a very full meeting of the committee upon the intended New Buildings Bill was held at the Freemasons Tavern, Mr. H. Biers in the chair, when the present Bill up to Section 20 was discussed, and such alterations made therein as appeared to the committee necessary to amend it. The committee adjourned to Tuesday the 16th inst.

MOSAIC WORK, ANCIENT AND MODERN.

At a meeting of the Society of Arts on the 3rd inst., Mr. W. F. Cooke, V.P., in the chair; Mr. Digby Wyatt read an essay "On the Art of Mosaic, Ancient and Modern." The author commenced by stating, that the most cursory glance at the subject must convince that this art, taking the form of either pavement or mural decoration, has been connected with most of the noblest efforts of architectural genius in all ages; and as it is the wish of many at the present time to effect the revival of this art, he would endeavour to convey as clear an idea as possible of the nature, history, and condition of this graceful handmaid to the science of decoration. The first positive notice of the existence of such an art occurs in the sixth verse of the first chapter of the book of Esther, wherein an account of the riches and luxury of the Palace of Ahasuerus is mentioned, and that passage clearly establishes the fact, that the Persians were acquainted with the art, and it is supposed communicated it to the Greeks, from whom the Romans obtained their first specimens. Ciampini divides the art into four principal varieties called tesselatum, sectile, figlinum, and vermiculatum. The first, the opus tesselatum, probably the most ancient; this kind of mosaic consisted of small cubes of marble, seldom averaging more than three-quarters of an inch square; the best specimens of this description of tessela occur at Pompeii, and in the Vatican. The second division of the art, the opus sectile, was also applied to pavements, and it is in this description of mosaic that the simple, yet magnificent pavement of the pantheon at Rome is executed. This variety of mosaic was formed of thin slices of different coloured marbles cut into slabs of a given form. The opus figlinum was more generally employed in mural decoration, and, according to Pliny, was first used in the decoration of the baths of Agrippa behind the pantheon; it consisted of figures, fruits, ornaments, &c., formed by means of small cubes of vitreous composition, composed of alumini and some metallic oxide to colour it; no specimen of this description of mosaic has ever been discovered in England. The fourth description of mosaic, or opus vermiculatum, is subdivided by Ciampini into three varieties. The opus major, generally employed in large pavements or ceilings, to represent the figures of gods, centaurs, &c. The opus medium was a much finer kind of work, and was generally applicable to walls. The third division, opus minor, or opus vermiculatum, was the finest and most elaborate of all the ancient Roman mosaics, and consisted of the most delicate pictures, formed entirely by minute pieces of marble and fictile work, many of the stripes being only the twentieth of an inch across. The most beautiful specimen that has been preserved to us is the one usually known by the name of Pliny's Doves, a copy of which in mosaics was exhibited. There is one kind of mosaic which the author had observed at Pompeii, and which he considers may not be inaptly termed the opus incertum of mosaics, composed of all sorts and kinds of marbles put together in irregular shapes, and when united into a mass with cement, and laid on the floor prepared to receive it, it is reduced to a polished face by friction. In completing the sketch of this art under the Romans, the author stated that the preparation ordinarily made by them for the reception of the mosaics consisted in their first placing a layer of large stones or flints, but with very little cement, on the ground. Upon this was placed a course of concrete, composed of smaller stones, and lime beaten and rammed with great care; upon this a third layer of cement was placed; the tesseræ or mosaics were then placed; and over the whole was poured liquid cement, so as to perfectly fill up the interstices between the cubes. During the reigns of the twelve Cæsars this art rose to an unexampled popularity. During the reign of Hadrian (A.D. 138) to that of Caracalla, the art appears to have lost in quality. After the year 220 it became obscured by the clouds which swept the Roman empire. From the time of Constantine three varieties arose, which obtained universally in Italy from the fourth to the fourteenth century, and during nearly 1,000 years changed but little either in principle or design. The emperor, Alexander Severus (A.D. 222 to 235) brought with him from Alexandria great quan-

tities of porphyry and serpentine, which he caused to be worked into small squares and triangles, and variously combined, thereby laying the foundation of this art, which formed the pavement of all the rich Italian churches. We have an interesting specimen in Westminster Abbey, referred to the year 1260.

The author, after tracing the history on to its decline, and giving some account of the encaustic tiles, proceeded to state the circumstances which had of late years led to its partial revival. He also gave a detailed description of the process of manufacture employed by Messrs. Singer and Pether, and Messrs. Minton and Co., and concluded by urging on architects, and the public generally, the applicability of the manufacture to the purposes of decoration.

INSTITUTION OF CIVIL ENGINEERS.

On the 2nd instant, the society met for the first time in the new theatre, and a paper by Mr. W. E. Newton was read, giving a description of the method employed by Mr. Herron for the construction of the permanent way of the Philadelphia and Reading, and other railways in the United States. The method was a deviation both from the systems of the longitudinal and the transverse sleepers, crossing each other and spiked together at the intersections with wooden trenails or iron pins, according to circumstances, forming an extended platform, upon which their longitudinal bearers were laid, supporting bridge-shaped rails with wrought-iron chairs. The paper gave an account of several deviations from the general system, such as making the trellis-work of iron laid in bitumen, &c., and also a detail of the amount of traffic conveyed along the railway; whence it appeared, that within one year and five days from its being opened for general use, one million four hundred thousand tons of goods had been conveyed along it, without any prejudicial effect, and, in fact, with less wear and tear than was usual upon railways in the States. The cost of a single line of permanent way was about 850*l.* per mile. From the discussion that ensued, it appeared to be the opinion, that although the system might succeed in a country where timber abounded, it was inapplicable for English railroads; and exceptions were taken to the general features of the construction for high speed, as the rails, which weighed only forty-four pounds per yard, and were of a bridge form, could not resist the impact of the wheels at great velocity: the junction of the diagonally laid sleepers would become loosened, and there would be too much deflection between the bearing points.

Correspondence.

URBAN BURIAL.

Sir,—I trust you will kindly give admission to a few very concise remarks from a former correspondent, whose experience, brought to bear on the above subject, has certainly been of use, and had a degree of usefulness felt, if not acknowledged, in conclusions drawn as to the general necessity of a novel and substantially ameliorated system.

For, while several have given sketches, or filled up representations of individual "horrors,"—in *your pages alone* has appeared an orderly systematic notice of London churchyard deficiencies, caused by the utter disproportion of room to population; also some suggestions for "joint parochial cemeteries;"—the two having been, at any rate, and claiming a humble merit, *useful* in the reception of any comprehensive general design.

Whilst the grand abuses have been sufficiently dilated upon, the grief to private Christian and human feeling, owing to the miserable and disturbed wretched places in which survivors are compelled to leave a loved corpse, has certainly not had the mention (though it may have been thought of), which might have been expected or wished.

The writer would be the last to forward any *Gallo-Mania*, but will submit that, as in *Abattoirs*, and extra urban markets, preventing a *load* of cruelty and insalubrity, seen and unknown, so in sepulture; Paris having in three grounds, full *four hundred* acres for one million inhabitants, and London (besides new cemeteries, which are not compulsive) *one hundred* for *two millions*. They "manage these things better in France."—I am, Sir, &c.,

Feb. 8th, 1847. J. D. Parry.

STATE OF THE TEMPLE CHURCH.

Sir,—I attended the morning service at the Temple Church yesterday, and was rather surprised and sorry, considering how lately it had been restored, to see the serious effect produced by the thrust of the groining, on the two opposite piers nearest the altar; especially the one immediately behind the pulpit, which appeared to me to sway from the perpendicular to the extent of at least 6 inches. I should feel obliged by your informing me whether this has been noticed, and whether any precautions are being taken to arrest the mischief.

I am, Sir, &c., F. C.

P.S. For your satisfaction, I inclose my card.

London, Feb. 8, 1847,

Miscellanea.

Chalk Fuel.—The original paragraph, quoted from our columns by the press throughout the country, on the subject of the use of chalk, surrounded by coal, in producing intense heat at a small expense, has led to various experiments as well as considerable discussion, in the latter of which Dr. Murray, of Hull, has thought it advisable,—and very properly too, as a mere precaution, but not as a prohibition,—to object to the use of chalk for fuel from the liberation of carbonic acid gas during combustion. This, it is obvious, would form a fatal objection to its use in aboriginal huts where no proper means of ventilation are provided; but, as observed by the *Cambridge Advertiser*, which has ably advocated its use, or at least the trial of its quality, chalk would not be one jot or tittle more dangerous than charcoal, which, as our readers all know very well, can be, and constantly is, burned, without any danger, if proper precautions are observed.

Metropolitan Sewage Manure Company.—At a special meeting of this company, held last week to receive the draft of a bill for altering the line of their works, it appeared that it was proposed to construct an aqueduct in the parish of St. George, Hanover-square, near Skew-bridge, on the King's Scholars' Pond sewer, in the Vauxhall-bridge-road, and terminating at or near the Broadway in Hammersmith, together with the necessary works by which the aqueduct or conduit would pass through the parishes of St. Luke Chelsea, St. Mary Abbot's Kensington, through Fulham and Hammersmith. The tunnel here proposed was stated by their engineer to be preferable to iron, and would remove the opposition that existed to the erection of steam works in the metropolis. 30,000*l.* is the sum intended to be applied to the construction of the works.

Projected Works.—Advertisements have been issued during the past week for tenders for the erection of a large dwelling-house in Ipswich; and of new schools at Towlaw; for partly taking down and rebuilding the parish church of Wolsingham; for the excavation for and construction of sewers in the parish of St. Luke's, Chelsea; for best Guernsey granite, flints, and pit ballast for St. James's, Clerkenwell; for the regular supply of cliff stone at Hull; for the working of limestone and other quarries, or hauling stone for the repair of roads in Herefordshire; and for masons', carpenters', plasterers', slaters', plumbers', smiths', glaziers' and painters' works for three years at the fortifications, barracks, and other buildings at Edinburgh Castle, Leith Fort, Piershill, Queensberry, Greenlaw, and Blackness Castle.

French Plate-glass.—We have lately seen specimens of French plate-glass, at the Soho warehouse, in Soho-square, of great brilliancy and beautiful colour. The price is about the same as that of English glass. We are not anxious to recommend foreign productions over those of our own country, but as our plate-glass manufacturers shew little desire to improve, or to let the public have all the advantages which the reduction of duty should bring, a little competition will perhaps be serviceable. Plate-glass ought to be cheaper in England than it is.

Mr. Kearns Deane, Architect.—This gentleman, who, in connection with Sir Thomas Deane, his brother, has executed many works in Ireland which are well spoken of, expired in the prime of life, on the 30th ultimo. The *Cork Examiner* says, "Architecture, in the South of Ireland, has lost in him one of her most gifted exponents, one of her most enthusiastic upholders. His sorrowing friends justly attribute his death, in the maturity of manhood, to that spirit of zeal and unwearying devotion with which he toiled at his profession—wasting those precious hours that exhausted nature requires for her restoration, in incessant toil." The bow should not be always bent.

Competition.—Plans have been called for, by advertisement in the current newspapers, for a Fever Hospital at Bedford.

MEETINGS OF SCIENTIFIC BODIES

During the ensuing Week.

Monday, Feb. 15.—Statistical Society, 12, St. James's-square, 8 P.M.

Tuesday, 16th.—Institute of Civil Engineers, 25, Great George-street, 8½ P.M.

Wednesday, 17th.—Society of Arts, Adelphi, 8 P.M.; Association of Architectural Draughtsmen, 33, Southampton-street.

Thursday, 18th.—Royal Society, Somerset House, 8½ P.M.; Society of Antiquaries, Somerset House, 8 P.M.

TO CORRESPONDENTS.

"*Water Wheels.*"—A correspondent asks—"What power of water is necessary to carry a wheel for grinding corn and threshing, &c. from four to six-horse power; and the fall necessary to obtain a sufficient amount of water for a breast or over-shot wheel."

"*L. J. K.*"—Yes. Ask for the last editions.

"*Veritas.*"—We will examine the work in question. We have a different account of it from another quarter.

"*Tiles.*"—A correspondent wishes to know "where he can obtain tiles that represent brickwork, to cover vertical timber work."

"*Peckham Investment Company.*"—The name of the lowest contractor is Pettipher, and the amount £1,983, not £1,943, as stated.

"*Architectural Roofing Tiles.*"—We advise "T." to call on Mr. Hughes, at the Company's office, 158, Strand, who will give all information that may be required. They have a very good appearance.

"*Kensington Workhouse Competition.*"—Correspondents must bide their time. We will review this matter presently. We insert one letter elsewhere.

Received.—"E. D." (Pimlico), "J. J.," "W. C." (Smethwick), "H. D. G.," "W. B." "Report of Mr. Henry Austin, C.E., on the Sanatory Condition of the City of Worcester," with an Appendix; by Mr. Edwin Chadwick. "The Antiquary and Geologist's Companion; by Mr. W. Downing Bruce, F.S.A. (Longman, 1847). "A Collection of Useful Tables, compiled from good authorities."

Note.—A number of correspondents must excuse us till next week.

Erratum.—In letter respecting mill at Pleasley, p. 69, for *one* Mr. Burton, read *our* Mr. Burton.

NOTICE.—Covers for Volume IV. of The Builder, may be obtained at the Office, 2, York-street, price 2s.; or the publisher will bind sets at 3s. each.—A few volumes for 1846 remain on sale, price 21s.

ADVERTISEMENTS.

BUILDERS, CARPENTERS, and others, are respectfully informed, that they can be supplied with IRON COLUMNS, GIRDERS, RAIN-WATER PIPES, AREA and TRELLIS GRATINGS, SASH-WEIGHTS, RAILING, GATES, and IRON COPING, BALCONIES, VERANDAHS, CONSERVATORIES, FANCY STAIRCASES, IRON DOORS, STOVES, RANGES, &c.

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SOHO SLATE GLASS WAREHOUSE, 28, Soho-square, depot for the sale of the slate glass manufactured by the St. Gobain and St. Quirin and Cirey Companies, Paris. The attention of Architects, Builders, and the Trade generally is particularly requested to this article, which stands unrivalled for brilliancy of colour, superiority of substance and polish, and possesses almost faultless quality. This Plate Glass can be procured of any dimensions.—Applications for samples, lists of prices, and all further particulars, to be addressed to ALFRED GOSLETT, Agent, 28, Soho-square.

TO PLUMBERS, PAINTERS, AND GLAZIERS.

CROWN GLASS, in Crates of Eighteen Tables, at the following low prices, for ready money:—

		£ s. d.	
Crown Glass cut to size from one foot upwards, at 3d. per foot.	Thirds	4 4 0	Squares of Small Crown Glass, at 1d., 1½d., 2d. and 2½d. per foot.
	Fourths	3 10 0	
	C.C.	2 10 0	
	C.C.C.....	2 2 0	

SHEET GLASS of all descriptions equally low.—White Lead, Oil, Turps, Colours, and Varnishes, at WILLIAM FREDERICK FENTON'S Window Glass, Lead, Oil, and Colour Warehouse, 36, West Smithfield, London.
N.B. Sashes glazed at 4½ and 5d. per foot.

SASHES PRIMED, GLAZED, and sent to any part of London at 5d. per foot.

BUILDERS, PAINTERS, GLAZIERS, and others, supplied with every article used in the trade upon the best wholesale terms.
FOREIGN SHEET. BRITISH SHEET.
BRITISH CROWN. PROPAGATING GLASSES.
Coloured and Ornamental Glass, Flatted Crown, and Sheet Plate, for shop fronts, shew-cases, &c. The largest stock of cheap Glass in London for HORTICULTURAL PURPOSES.
Dry and good Colours of the best quality; Brushes, Dryers, and every article used in the trade, warranted.
VARNISHES and GENUINE WHITE LEAD; MILLED LEAD IN SHEETS, 22s. per cwt.; Lead Pipe, 23s. per cwt. Pumps, Water-closets, Basins, Brass-work, and all materials used by Plumbers.
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HERRING'S PATENT SAFETY WINDOW.—No invention ever offered the advantages to builders and the public; it will positively add 5 to 10 per cent. to all houses having it; repay the cost every two years; abolish all danger to life and limb, cleaning and repairing. It is in full operation (four different ways), forms a complete ventilator and sun-blind; all simple, cheap, and effective.—Apply for licenses and to inspect its real merits, to HERRING'S Patent Steam Bed-Feather Factory, 14, Kingsgate-street, London.

CHAS. WM. WATERLOW,
MANUFACTURER
of Sashes and Frames, and Joiner to the Trade, 123, Bunhill-row, Finsbury-square.—Well-seasoned materials, superior workmanship, lowest prices.—Upwards of 400 DOORS, and a large variety of Sashes and Frames, always on sale. Glazed goods securely packed for the country. Steam-struck Mouldings in any quantity.—N.B. This Establishment is worth the notice of all engaged in building.

ZINC WORK.

MESSRS. F. and J. HENLAND beg to call the attention of Builders and others to the following list of prices, for cash:—

3-inch Pipe	per foot 4½d.	9-inch Gutter....	per foot 4½d.
2½ ditto	" 3d.	4-inch ditto	" 5d.

Including Fixing.
Flats Covered and Cisterns Lined from 4½d. to 6d.; Cornice Gutters, 5d. to 7d., per foot superficial.—3, Cumberland-place, Newington, Surrey, opposite the Fishmongers' Almshouses.
N.B. Orders by Post punctually attended to.

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WALLIS'S PATENT LIQUID WOOD KNOTTING.—This newly-discovered Liquid Composition, which Messrs. Geo. and Thos. Wallis have the satisfaction of introducing to the Trade, possesses the important qualification of effectually stopping Knots in Wood, however bad, and preventing them exuding through and disfiguring the paint above.
Many substances have been used and much time spent in endeavouring to find a cure for a bad Knot, but hitherto without success. Messrs. Wallis therefore feel much pleasure in offering to the public an article so long and anxiously called for.
In the application, skill is not required; it is put on to the work with a brush like common paint, can be used in all climates and situations, and does not require heat.
Sold wholesale and retail, by Messrs. G. and T. Wallis, Varnish, Japan, and Colour Manufacturers, No. 64, Long Acre.

TODD'S PATENT PROTOXIDE PAINT manufactured by CHAS. FRANCIS and SONS, CEMENT WORKS, NINE ELMS, LONDON.
The properties of this Paint are peculiar for preventing iron from oxidation, wood from decay, and masonry from damp; it neither cracks nor blisters with the hottest sun, and is therefore most valuable for Railways, Boilers, Steam, Gas, and Water-pipes; Hot-houses, Forcing-houses, and for Shipping. Its adhesion is so great to iron and wood, that the hardest friction will scarcely remove it. It prevents vegetation on stuccoed buildings, and is not affected by spray of sea-water.
PROTOXIDE PAINT is sold ground in oil, and, compared with white-lead, its property of concealing is as 75 to 50, so that one hundred weight is equal to one and a half of lead. It works well under the brush, and forms with oil an unctuous and cohesive mixture. If blended with other paints it has a softer tone than white-lead. For houses painted during occupation, it is most preferable, being perfectly innoxious.

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LIME FOR PLASTERING, that may be used immediately without risk of blistering, manufactured expressly for Plastering, and sold at the usual price, at FORREST'S WHARF, Earl-street, Blackfriars. Sheds for the slacking and mixing of lime. Accommodation for loading and landing bricks, sand, ballast, &c.

TO BUILDERS AND OTHERS.

MESSRS. H. G. and E. ROSHER, having closed their Lime Wharf at Montague Close, Southwark, have removed their business to Albion Wharf, Holland-street, Bankside, where they intend keeping a constant supply of Greystone, Flame-burnt, and Plasterers' Lime, Sand, Cement, Bricks, Tiles, Chimney Pots, Fire Bricks, Lumps, Fire Clay, and other building materials. Messrs. ROSHER have also Lime Wharfs at Limehouse, Millbank-street, Westminster, and Kingsland Basin, Kingsland-road.
*** Ground Lime for Concrete.

ENCAUSTIC, VENETIAN, and other PATENT TILES and MOSAIC PAVEMENTS may be purchased at MINTON and Co.'s warehouse, 9, Albion-place, Surrey side of Blackfriars-bridge.—J. M. BLASHFIELD, Agent. The above tiles have lately been considerably reduced in price.
N.B. An assortment of plain and ornamental floor furniture, slabs, and tiles for fire-places, &c.

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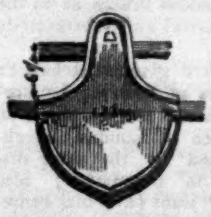
PATENT ARCHITECTURAL ROOFING TILES.



ARCHITECTS, Builders, and Others, may now be supplied with these ornamental Tiles, which for security, beauty, and effect, surpass every other kind of roofing, whilst their cost but little exceeds the covering with common pantiles, and their superiority over slating is at once apparent.
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PAVING, 2s. 9d. PER SQUARE YARD. Basements, Foot-walks, Malt-houses, Corn Stores, Floors of Warehouses, and every description of Pavement laid down at the above low price, and the work guaranteed.—Apply to JOHN PILKINGTON, POLONCEAU'S BITUMEN PAVEMENT OFFICE, 15, WHARF-ROAD, CITY-ROAD.—N.B. Country Agents and Railway Engineers and Contractors supplied with the best bitumen for covering bridges and arches.

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